

ILLINOIS MUNICIPAL RETIREMENT FUND  
MINUTES OF  
REGULAR MEETING NO. 20-03  
MARCH 20, 2020



ILLINOIS MUNICIPAL RETIREMENT FUND

MEETING NO. 20-03

REGULAR MEETING

OF THE

BOARD OF TRUSTEES

The Regular Meeting of the Board of Trustees was held at 9:00 a.m. on March 20, 2020, in the Fund Office at 2211 York Road, Suite 400, Oak Brook, Illinois, and via teleconference. (Per Executive Order 2020-07, All IMRF Board Members may participate via teleconference.)

Mr. Miller presided as Chair and called the meeting to order.

Ms. Janicki Clark took a roll call:

Present: Williams\*,Copper\*, Henry\*, Kuehne\*, Miller\*, Stanish\*, Stafford\*  
Absent: Wallace

\*All Trustees were present via teleconference.

Ms. Dean and Messrs. Kazemi and Born from Wilshire Associates were also present via teleconference.

(20-03-01) (Investment Manager Activities - Wilshire Associates) The Chief Investment Officer reported that the fund value as of February 29, 2020 was \$42.4 billion, and as of March 19, 2020 the fund value was \$36.1 billion (based on preliminary data).

She noted the market is currently very volatile due to the COVID-19 pandemic.

Next, the Chief Investment Officer presented the following report of IMRF's investment performance for the month of February 2020.



**Wilshire**

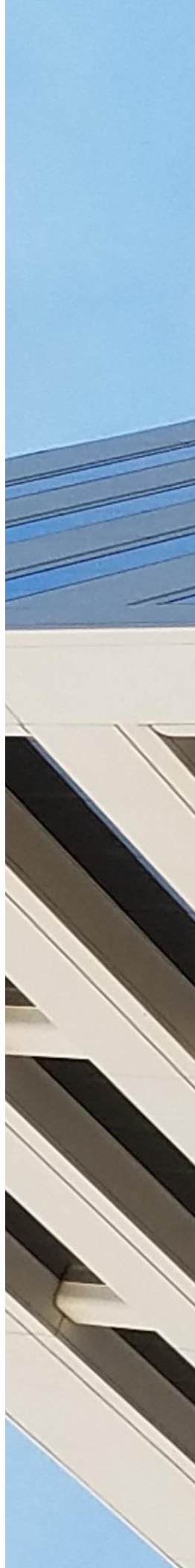
03/20/2020

Prepared for



# WILSHIRE ASSOCIATES

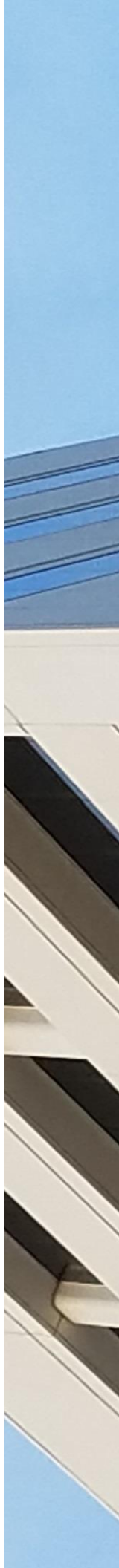
Wilshire Consulting



Monthly Investment Summary as of February 29, 2020  
& Diversification Review

Page 269425

March 20, 2020



# Capital Market Review

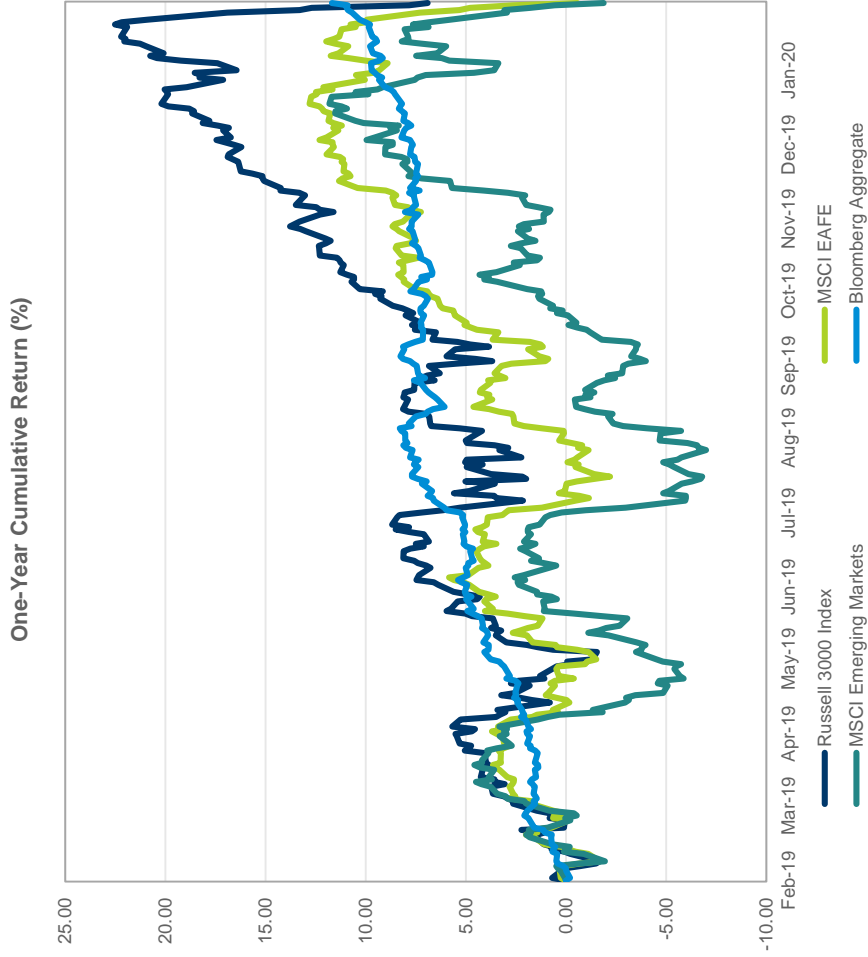
**Market Commentary**

U.S. employers added an additional 237,000 jobs in February, although these healthy results were overshadowed by growing concern of the outbreak of the COVID-19 (formerly, Wuhan coronavirus).

COVID-19 replaced trade uncertainty in February as the main concern for global markets. Growing fears of near-term negative effects on China manufacturing and global growth dominated better-than-expected U.S. Q4 earnings.

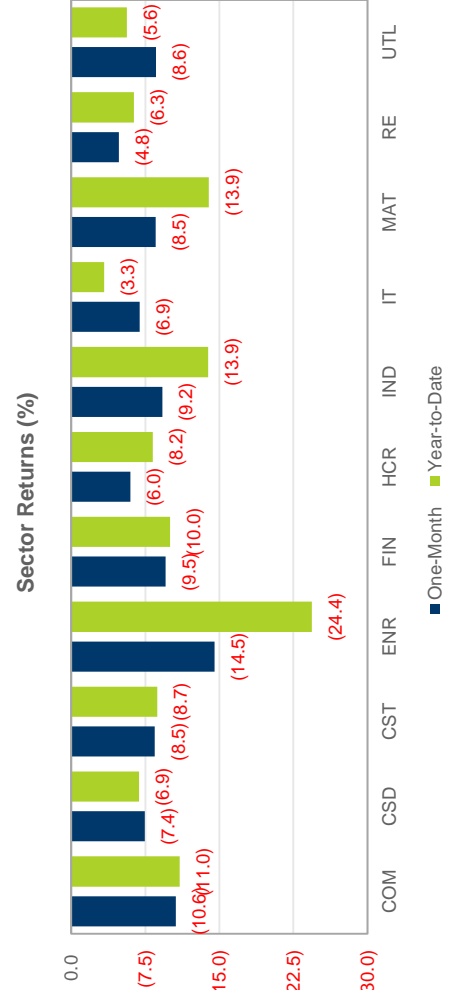
Manufacturing in the United States, marked by the ISM Manufacturing Index, narrowly remained in expansionary territory in February at 50.1. Note that an index value above 50.0 suggests an expansionary environment for the manufacturing sector. By the end of the month; however, early signs of virus-related supply disruption began to hinder performance.

Despite the concerns of COVID-19, consumer sentiment was up during February. The University of Michigan Consumer Sentiment Index reached 101.0, breaking 100.0 for just the second time since September 2018. Early indicators for March show a decline in sentiment, measuring 95.9 on March 13, 2020.





U.S. Equity Indices (%)	MTD	QTD	YTD	1 Year	3 Years	5 Years	10 Years
Russell 3000 Index	(8.19)	(8.29)	(8.29)	6.90	9.28	8.72	12.47
Standard & Poor's 500 Index	(8.23)	(8.27)	(8.27)	8.19	9.87	9.22	12.65
Russell 1000 Index	(8.17)	(8.07)	(8.07)	7.82	9.73	9.00	12.63
Russell 2500 Index	(8.39)	(10.25)	(10.25)	(180)	5.10	5.81	11.20
Russell 2000 Index	(8.42)	(11.36)	(11.36)	(4.92)	3.52	5.12	10.41
Russell Micro Cap Index	(6.84)	(11.18)	(11.18)	(6.69)	2.44	3.87	9.76
Russell 1000 Index	(8.17)	(8.07)	(8.07)	7.82	9.73	9.00	12.63
Russell 1000 Growth Index	(6.81)	(4.73)	(4.73)	15.11	15.67	12.41	14.78
Russell 1000 Value Index	(9.68)	(11.63)	(11.63)	0.54	3.78	5.50	10.39
Russell 2000 Index	(8.42)	(11.36)	(11.36)	(4.92)	3.52	5.12	10.41
Russell 2000 Growth Index	(7.22)	(8.24)	(8.24)	(0.72)	7.85	6.48	12.07
Russell 2000 Value Index	(9.72)	(14.59)	(14.59)	(9.29)	(0.83)	3.61	8.66
Russell 3000 Index	(8.19)	(8.29)	(8.29)	6.90	9.28	8.72	12.47
GICS - Communication Services	(10.57)	(10.99)	(10.99)	(0.02)	10.56	8.32	8.32
GICS - Consumer Discretionary	(7.44)	(6.87)	(6.87)	7.05	11.63	9.54	15.20
GICS - Consumer Staples	(8.46)	(8.69)	(8.69)	6.38	1.74	4.33	10.55
GICS - Energy	(14.52)	(24.38)	(24.38)	(27.33)	(11.47)	(8.63)	(0.49)
GICS - Financials	(9.54)	(10.02)	(10.02)	5.84	7.67	9.34	11.43
GICS - Health Care	(5.97)	(8.24)	(8.24)	3.65	10.10	7.25	14.13
GICS - Industrials	(9.22)	(13.87)	(13.87)	0.28	3.40	2.47	12.44
GICS - Information Technology	(6.93)	(3.33)	(3.33)	23.54	20.51	17.05	16.65
GICS - Materials	(8.53)	(13.94)	(13.94)	(2.82)	1.47	3.52	8.79
GICS - Real Estate	(4.83)	(6.34)	(6.34)	5.66	6.42	0.84	7.53
GICS - Utilities	(8.57)	(5.63)	(5.63)	10.16	7.19	8.44	11.33



## Market Commentary

The U.S. stock market, represented by the Russell 3000 Index, was down -8.2% for the month of February 2020; however, the one-year return remains positive, up +6.9%.

Although the U.S. reported strong economic indicators that contributed to a positive stock market – positive jobs growth, increase in consumer sentiment, expansionary manufacturing environment – COVID-19 coronavirus continued to hammer financial markets during February and was the single largest headwind to U.S. equity performance.

Large capitalization stocks outperformed small caps for the month as the Russell 1000 Index returned -8.2% versus -8.4% for the Russell 2000 Index. The Russell Micro Cap Index was down -6.8% for the month, and now down for the trailing one-year, -6.7%.

Growth stocks again led value stocks during and have continued their outperformance during trailing one-year.

Of the eleven major sectors in the index, all were negative during the month and year-to-date. Energy, Materials and Industrials were the largest laggards for the month down between -5.1% and -11.5%.



## Market Commentary

Equity markets outside of the U.S. modestly outperformed the U.S. equity market during February; however, were still down nearly -8.0% for the month.

Continued growing concern and uncertainty regarding the impact of COVID-19 and a slowdown in global growth impeded returns across all Non-U.S. markets. A surge in new cases, specifically in Italy and Korea added to the growing concerns from the COVID-19 outbreak.

Investors continued to remain concerned regarding the downside of Chinese economic growth as manufacturing and transportation around the country has been all but halted.

Outside of the coronavirus scare, Canada's Q4 growth results were muted, as GDP barely grew during the quarter.

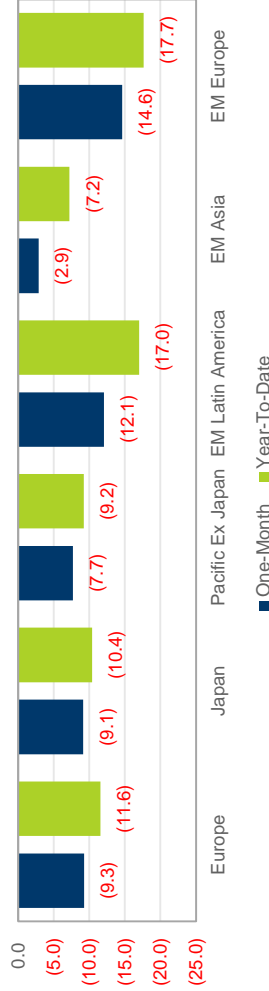
Broad Non-U.S. Equity markets, including both Developed and Emerging Markets were down -7.9% during February.

Developed Markets trailed Emerging Markets -9.0 vs. -5.3%. EM Asia and EM Latin America were down -2.9% and -12.1%, respectively during the month.

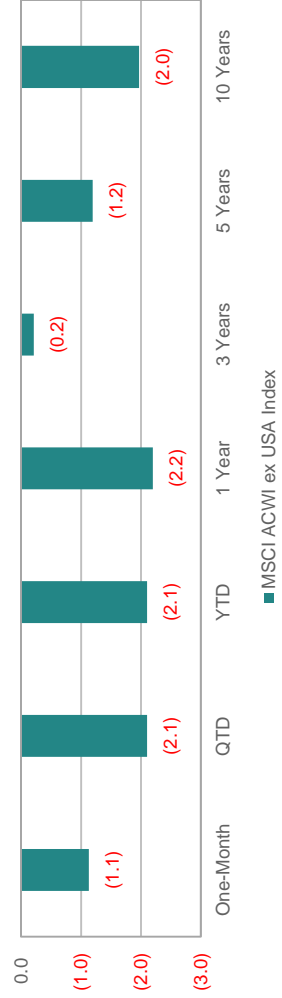
The U.S. Dollar strengthened during the month, providing a headwind for U.S. based investors.

Non-U.S. Equity (USD %)	MTD	QTD	YTD	1 Year	3 Years	5 Years	10 Years
MSCIAC World ex U.S. Index	(7.91)	(10.38)	(10.38)	(0.69)	4.15	2.18	4.34
MSCIEAFE Index	(9.04)	(10.94)	(10.94)	(0.57)	3.92	1.96	4.83
MSCIEmerging Markets Index	(5.27)	(9.69)	(9.69)	(1.88)	4.89	2.73	3.16
MSCIAC World ex U.S. Small Index	(9.20)	(12.03)	(12.03)	(2.18)	2.86	3.31	5.80
MSCIEurope Index	(9.28)	(11.56)	(11.56)	(0.64)	4.23	1.27	4.73
MSCIJapan Index	(9.14)	(10.38)	(10.38)	1.07	3.35	3.65	5.11
MSCIPacific ex Japan Index	(7.69)	(9.22)	(9.22)	(3.40)	3.65	2.76	5.21
MSCIEM Latin America Index	(12.06)	(16.99)	(16.99)	(11.89)	0.38	0.83	(1.97)
MSCIEM Asia Index	(2.86)	(7.22)	(7.22)	1.39	6.79	4.05	5.61
MSCIEM Europe Index	(14.61)	(17.66)	(17.66)	(0.13)	5.08	3.21	(0.41)
Local Currency (%)	MTD	QTD	YTD	1 Year	3 Years	5 Years	10 Years
MSCIAC World ex U.S. Index	(6.78)	(8.28)	(8.28)	151	4.36	3.37	6.31
MSCIEAFE Index	(8.08)	(9.21)	(9.21)	124	3.48	2.82	6.52
MSCIEmerging Markets Index	(3.83)	(7.00)	(7.00)	133	6.83	4.93	5.87

Regional Returns (%)



Currency Effect (%)





# Fixed Income Market

03/20/2020

## Market Commentary

The U.S. Treasury yield curve generally fell during the month across the maturity spectrum. The 10-year Treasury yield ended the month at 1.07%, down 85 basis points from December 31, 2019.

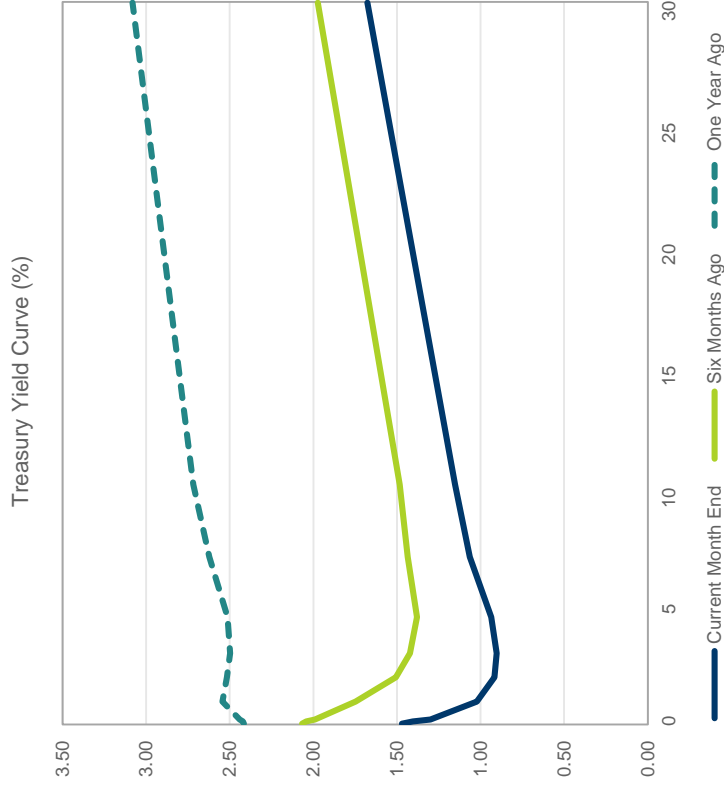
Federal Reserve Chairman, Jerome Powell, suggested during his February 2020 biannual report to Congress that the Fed continues to closely monitor the prolonged economic impact of the coronavirus. Given the sell-off in February, and the continued market decline month-to-date in March, the bond market is now expecting almost four Fed rate cuts by the end of the year.

Credit spreads widened during February. The spread on high yield bonds reached 4.75% - the widest gap over treasuries since December 2018.

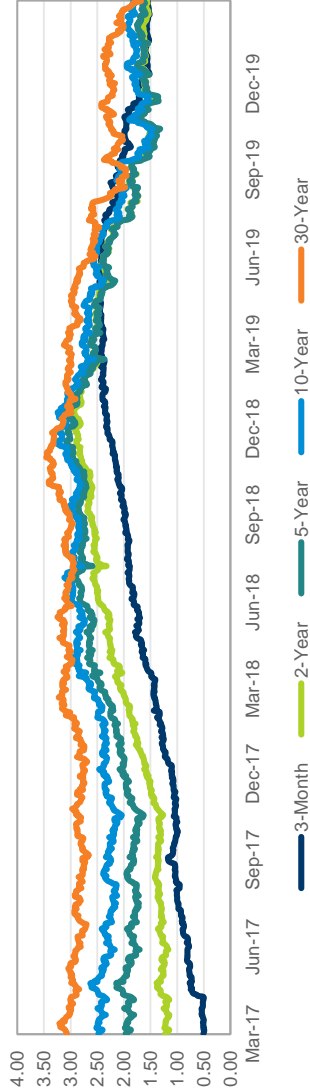
U.S. Fixed Income	M TD	Q TD	YTD	1 Year	3 Years	5 Years	10 Years
Bloomberg Barclays U.S. Aggregate	180	3.76	3.76	1168	5.01	3.57	3.93
Bloomberg Barclays Long Gov't/Credit	4.01	9.44	9.44	28.73	10.58	6.74	8.32
Bloomberg Barclays LT Treasury	6.70	14.00	14.00	31.64	11.01	6.32	8.11
Bloomberg Barclays U.S. TIPS	138	3.51	3.51	10.76	4.06	2.94	3.67
Bloomberg Barclays U.S. Credit	136	3.73	3.73	15.30	6.54	4.78	5.50
Bloomberg Barclays U.S. High Yield	(141)	(138)	(138)	6.10	4.86	5.19	7.26
ICE BofA U.S. High Yield Cash Pay	(158)	(157)	(157)	5.88	4.75	5.14	7.13
S&P LSTA Levered Loan Index	(134)	(0.78)	(0.78)	3.47	3.71	3.92	4.68
ICE BofA US 3-Month Treasury Bill	0.15	0.28	0.28	2.18	1.73	1.13	0.61

Global Fixed Income	M TD	Q TD	YTD	1 Year	3 Years	5 Years	10 Years
Bloomberg Barclays Global Aggregate	0.67	1.96	1.96	7.92	4.39	2.90	2.62
Bloomberg Barclays Global A ggregate (Hdg.)	1.22	3.05	3.05	10.22	5.18	3.93	4.24
JPM GBI-EM Index	(3.48)	(4.35)	(4.35)	3.04	3.08	2.08	2.14
JPM EMBI Global Index	(0.81)	0.92	0.92	9.90	5.17	5.75	6.48
JPM Corporate EMBI Index	(0.03)	1.42	1.42	10.73	5.92	5.96	6.63



Daily Treasury Yield Curve Rates (%)





Real Assets	MTD	QTD	YTD	1 Year	3 Years	5 Years	10 Years
Wilshire US RESI	(7.78)	(7.11)	(7.11)	3.94	4.25	5.03	11.27
Wilshire Global RESI	(7.61)	(7.36)	(7.36)	3.14	5.03	4.32	9.89
Bloomberg Commodity Index	(5.04)	(12.03)	(12.03)	(11.05)	(5.19)	(6.19)	(5.57)
S&P GSC Index	(8.39)	(18.31)	(18.31)	(15.07)	(3.94)	(7.83)	(7.07)
Alerian MLP Index	(4.05)	(18.87)	(18.87)	(23.46)	(12.41)	(10.62)	1.52
DJ Brookfield Global Infrastructure	(7.53)	(6.15)	(6.15)	8.49	8.13	5.41	9.48
FTSE Global 50/50 Infrastructure	(8.86)	(6.84)	(6.84)	6.46	8.70	6.96	10.09

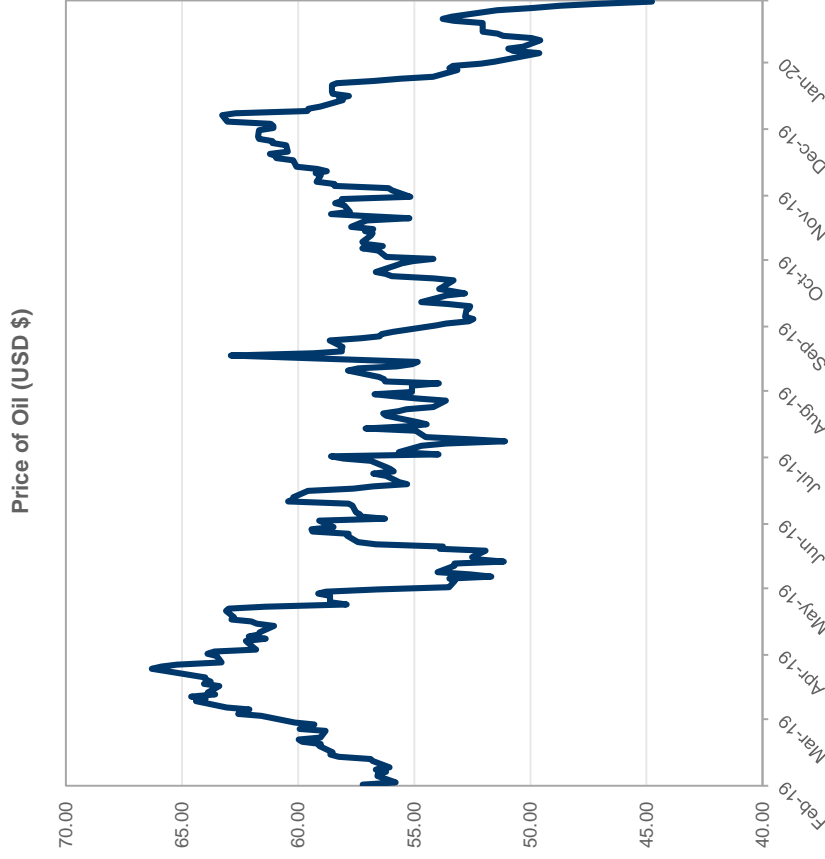
**Market Commentary**

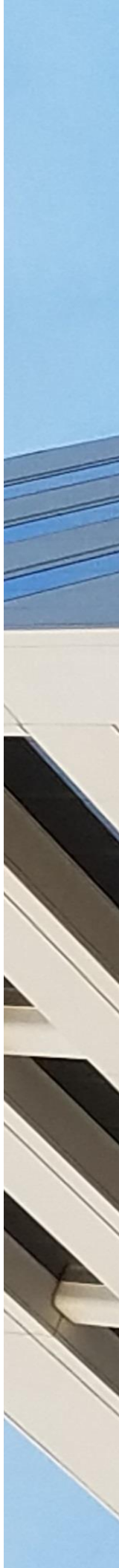
U.S. real estate securities were down during February (-7.8%), but remain positive for the trailing one-year (+3.9%). Similarly, global real estate securities were down during February (-7.6%), but remain positive for the one-year (+3.1%).

Commodity results were largely negative for the month as crude oil fell -13.2% to \$44.76 per barrel. Year-to-date, the crude oil has fallen nearly -27%, ending 2019 at \$61.06 per barrel.

Midstream Energy (MLPs) were down for the month (-14.1%) as well as the trailing one-year (-23.5%)

Finally, gold prices were up for the month and finished at approximately \$1,586 per troy ounce, up +4.5% from year-end.





# IMRF Performance

# IMRF Commentary

03/20/2020

## IMRF Commentary

The Illinois Municipal Retirement Fund (“IMRF”) ended February 2020 with a market value of \$42.4 billion, down for the month by approximately \$2.0 billion. The Fund returned -4.33% for the month, underperforming the Total Fund Benchmark, which returned -3.90%.

During the month, the allocation to U.S Equity, on average, was overweight by 2.8% vs. the Total Fund Benchmark. International Equity, on average, was overweight by 0.8%. Given the decline in both U.S. and International Equity markets (the U.S. Equity market returned -8.19%, and the International Equity market returned -7.90%), overweight positions detracted relative value.

Performance of the Fixed Income portfolio was challenged due to spread widening within Credit markets. The Fixed Income Portfolio underperformed its benchmark for the month, 1.20% vs. 1.80%. Positions within Corporate Credit, High Yield, and Emerging Markets detracted value. A modest overweight (0.8%) to Fixed Income; however, proved to be a positive contributor to relative performance.

The International Equity Portfolio matched the benchmark return for the month -7.90% vs. -7.90%. Allocations to Large Cap Growth (-7.58%) and Emerging Markets (-6.16%) added relative value, while allocations to Large Cap Value (-8.61%) and Small Cap (-9.20%) detracted.

The U.S. Equity Portfolio performed in-line with the benchmark for the month, returning -8.21% vs. -8.19%. The Portfolio’s allocation to Large Cap Growth (-6.12%) added relative value, while allocations to Small Cap Value (-10.54%) detracted.

The Public Real Assets Portfolio was ahead of its benchmark for the month -8.18% vs. -8.62%.

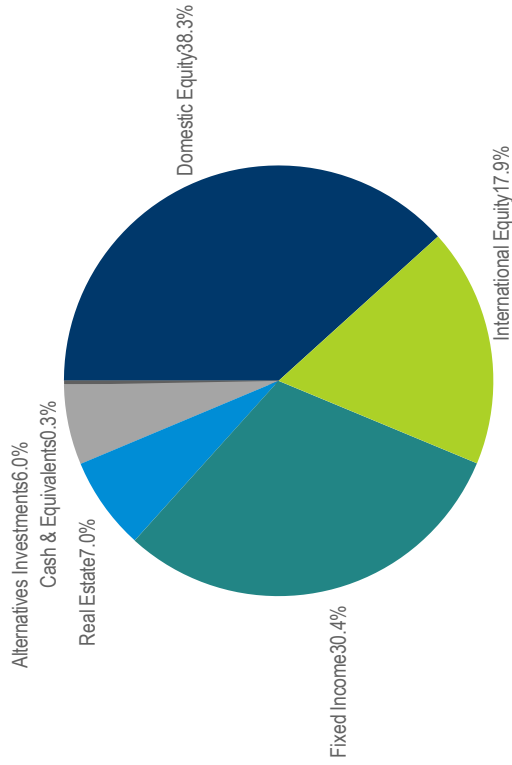
# Asset Allocation

Total Fund

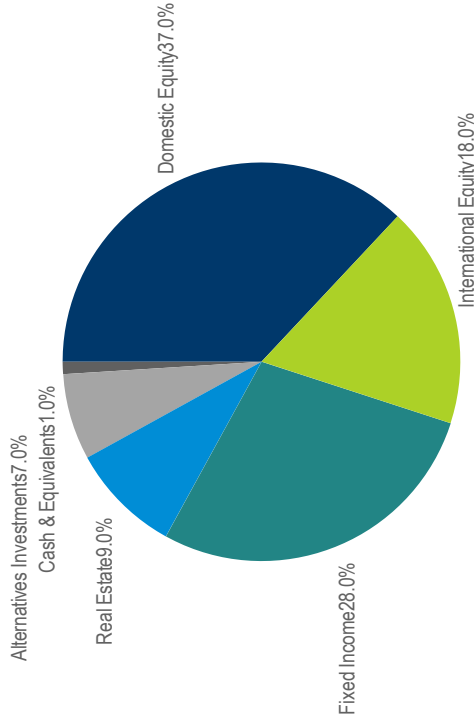
Periods Ended As of February 29, 2020

03/20/2020

Actual Allocation



Target Allocation



	Actual Allocation \$Millions	Actual Allocation %	Target Allocation %	Differences %	Differences \$Millions
Total Fund	42,409	100.0	100.0	0.0	
Domestic Equity	16,248	38.3	37.0	1.3	556
International Equity	7,611	17.9	18.0	-0.1	-23
Fixed Income	12,905	30.4	28.0	2.4	1,030
Real Estate	2,969	7.0	9.0	-2.0	-848
Alternatives Investments	2,549	6.0	7.0	-1.0	-420
Cash & Equivalents	128	0.3	1.0	-0.7	-296

# Total Fund Attribution

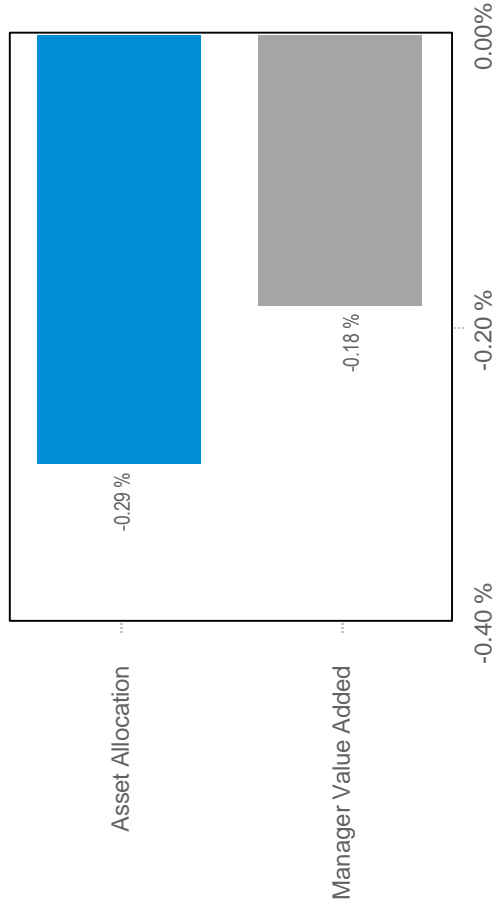
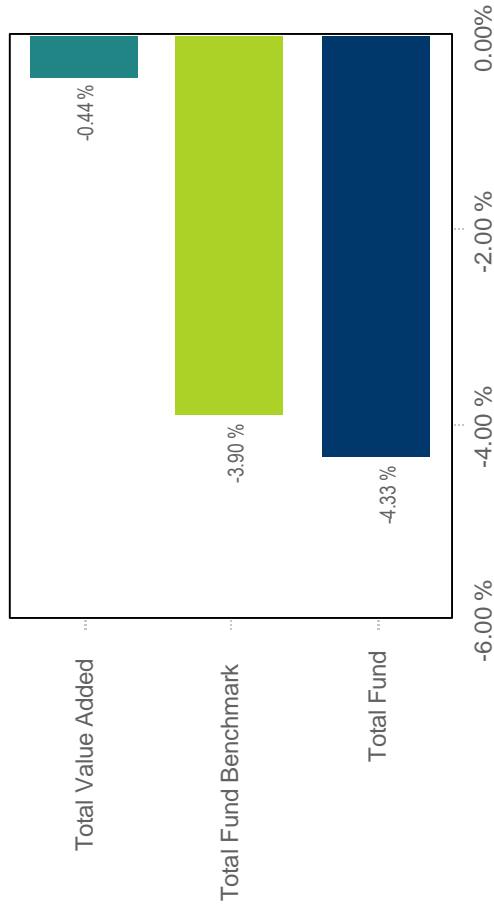
Total Fund

1 Month Ending February 29, 2020

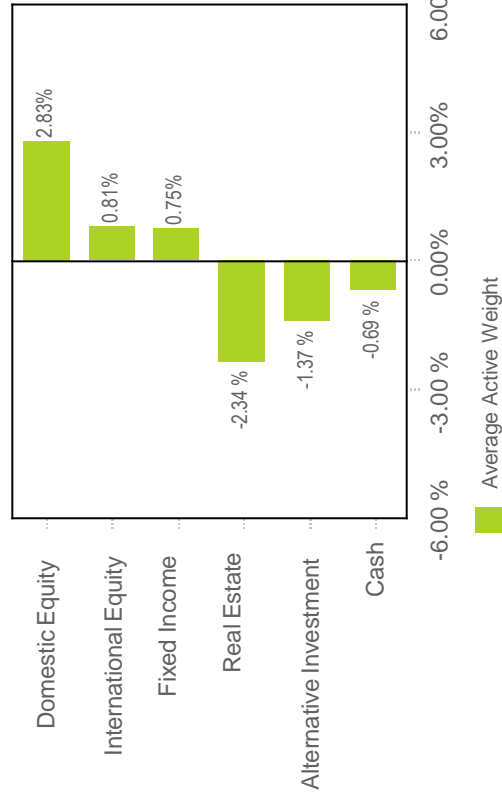
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## Total Fund Performance

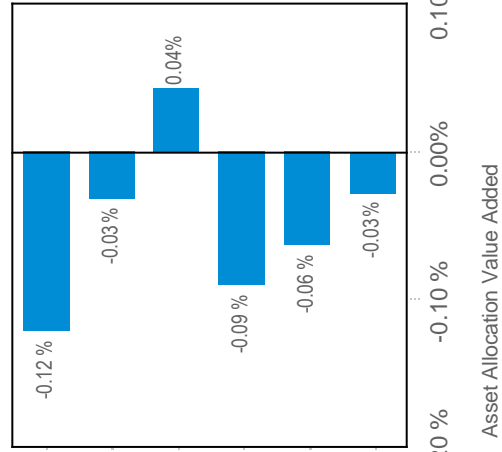
Total Value Added: -0.48 %



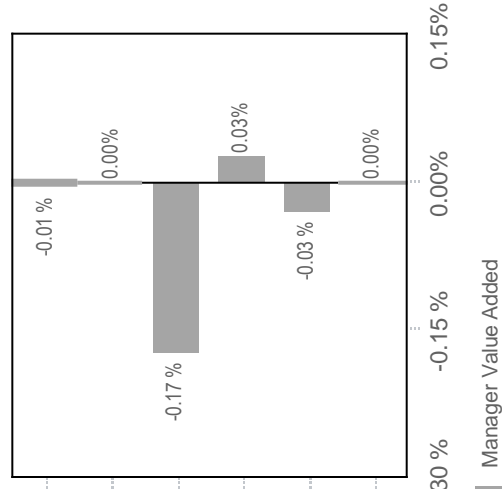
## Asset Class Under or Overweighting



## Asset Allocation Value Added: -0.29 %



## Total Manager Value Added: -0.18 %



Total Fund Benchmark = 37.0% Russell 3000 Index, 28.0% Blimbg Aggregate, 18.0% MSCI ACWI ex US, 9.0% NCREIF NFI-ODCE Val Wt Nt, 7.0% 9% Annually and 1.0% 3-month Treasury Bill.

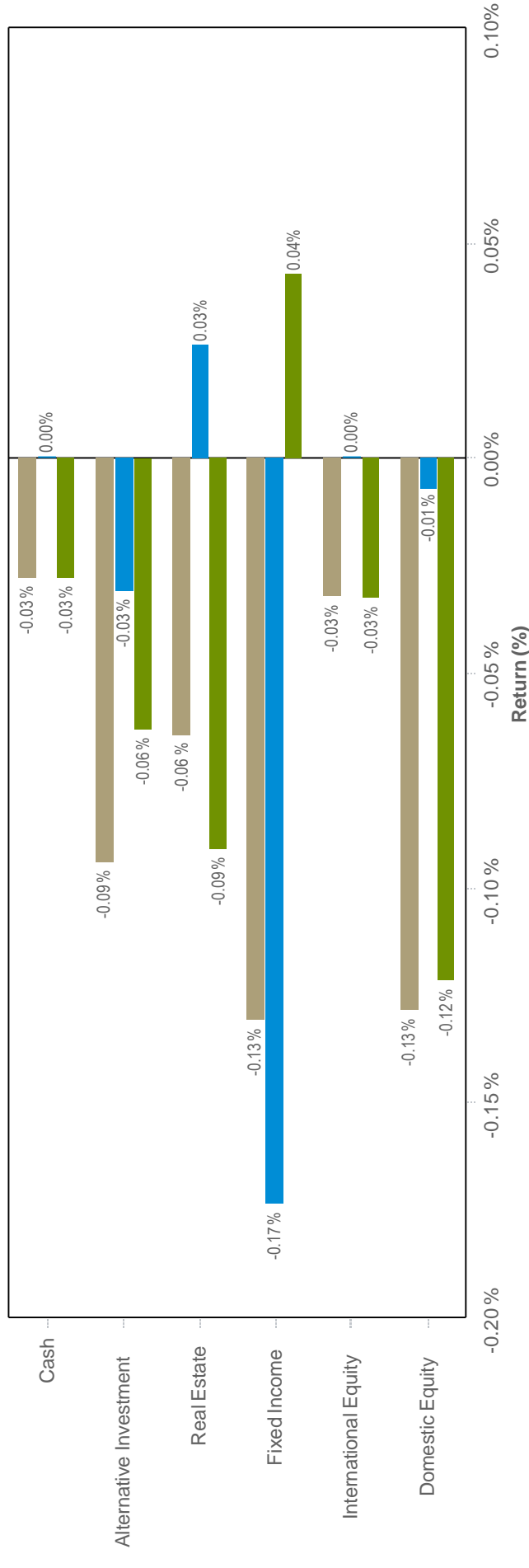
# Total Fund Attribution

Total Fund

1 Month Ending February 29, 2020

03/20/2020

Relative Attribution by Asset Class



Relative Attribution Effects

	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	39.8	37.0	-8.20	-8.19	-0.01	-0.12	-0.13
International Equity	18.8	18.0	-7.90	-7.90	0.00	-0.03	-0.03
Fixed Income	28.8	28.0	1.20	1.80	-0.17	0.04	-0.13
Real Estate	6.7	9.0	0.40	0.00	0.03	-0.09	-0.06
Alternative Investment	5.6	7.0	0.17	0.72	-0.03	-0.06	-0.09
Cash	0.3	1.0	0.26	0.15	0.00	-0.03	-0.03
<b>Total Fund</b>	<b>100.0</b>	<b>100.0</b>	<b>-4.33</b>	<b>-3.90</b>	<b>-0.18</b>	<b>-0.29</b>	<b>-0.44</b>

Total Fund Benchmark = 37.0% Russell 3000 Index, 28.0% BlmBg Aggregate, 18.0% MSCI ACWI ex US, 9.0% NCREIF NFI-ODCE Val Wt Nt, 7.0% 9% Treasury Bill.

Periods Ended February 29, 2020

	Performance (%)										Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	
<b>Total Fund</b>	<b>-4.30</b>	<b>-4.58</b>	<b>-4.58</b>	<b>5.76</b>	<b>7.04</b>	<b>6.05</b>	<b>8.59</b>	<b>6.27</b>	<b>8.40</b>	<b>9.72</b>	<b>1/1/1982</b>
Total Fund - Net	-4.33	-4.62	-4.62	5.58	6.85	5.83	8.36				
Total Fund Benchmark	-3.90	-3.83	-3.83	6.94	6.93	6.16	8.26				
<b>Domestic Equity</b>	<b>-8.16</b>	<b>-8.95</b>	<b>-8.95</b>	<b>3.19</b>	<b>8.01</b>	<b>7.76</b>	<b>12.10</b>	<b>6.20</b>	<b>10.24</b>	<b>11.34</b>	<b>1/1/1982</b>
Domestic Equity - Net	-8.21	-9.01	-9.01	2.99	7.80	7.53	11.84				
Blended Benchmark (U.S. Equity)	-8.19	-8.29	-8.29	6.90	9.28	8.72	12.49	6.03	9.90		
U.S. Equity IMRF Custom Benchmark	-8.36	-8.92	-8.92								
<b>International Equity</b>	<b>-7.85</b>	<b>-10.44</b>	<b>-10.44</b>	<b>0.64</b>	<b>5.02</b>	<b>3.23</b>	<b>5.97</b>	<b>5.00</b>	<b>6.63</b>	<b>7.47</b>	<b>9/1/1986</b>
International Equity - Net	-7.90	-10.51	-10.51	0.34	4.68	2.89	5.64				
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34	3.42			
International Equity IMRF Custom Benchmark	-7.94	-10.52	-10.52								
<b>Fixed Income</b>	<b>1.22</b>	<b>3.04</b>	<b>3.04</b>	<b>10.88</b>	<b>5.23</b>	<b>4.09</b>	<b>4.85</b>	<b>5.67</b>	<b>6.77</b>	<b>8.24</b>	<b>1/1/1982</b>
Fixed Income - Net	1.20	3.01	3.01	10.74	5.08	3.94	4.70				
Bimbg. Barc. U.S. Aggregate	1.80	3.76	3.76	11.68	5.01	3.58	3.93	5.18	6.07	7.74	
Fixed Income IMRF Custom Benchmark	1.39	3.13	3.13								
<b>Real Estate</b>	<b>0.40</b>	<b>0.99</b>	<b>0.99</b>	<b>9.72</b>	<b>9.54</b>	<b>9.89</b>	<b>11.12</b>	<b>8.11</b>	<b>5.05</b>	<b>5.56</b>	<b>5/1/1985</b>
Real Estate - Net	0.40	0.99	0.99	9.66	9.52	9.86	11.10				
Blended Benchmark (Real Estate)	0.00	0.00	0.00	3.56	5.77	7.54	10.41	7.35	7.50	7.66	
<b>Alternatives Investments</b>	<b>0.18</b>	<b>1.05</b>	<b>1.05</b>	<b>8.82</b>	<b>13.52</b>	<b>10.09</b>	<b>9.60</b>	<b>7.99</b>	<b>11.61</b>	<b>10.84</b>	<b>2/1/1986</b>
Alternatives Investments - Net	0.17	1.05	1.05	8.80	13.40	9.87	9.35				
Alternatives Custom Benchmark	0.72	1.45	1.45	9.00	9.00	9.00	9.10	11.00	12.32	12.64	
<b>Private Equity</b>	<b>0.21</b>	<b>0.71</b>	<b>0.71</b>	<b>10.43</b>	<b>16.39</b>	<b>12.96</b>	<b>12.59</b>	<b>9.70</b>	<b>14.15</b>	<b>13.04</b>	<b>2/1/1986</b>
Alternatives Custom Benchmark	0.72	1.45	1.45	9.00	9.00	9.00	9.10	11.00	12.32	12.64	
<b>Agriculture</b>	<b>-0.19</b>	<b>4.71</b>	<b>4.71</b>	<b>-1.45</b>	<b>-1.87</b>	<b>2.48</b>	<b>9.01</b>	<b>7.34</b>	<b>3.60</b>	<b>7.13</b>	<b>10/1/1997</b>
NCREIF Farmland Index	0.00	0.00	0.00	4.81	5.91	7.02	11.00	12.28	5.87	11.72	
<b>Timberland</b>	<b>0.00</b>	<b>2.92</b>	<b>2.92</b>	<b>2.85</b>	<b>1.60</b>	<b>0.94</b>	<b>2.87</b>	<b>3.60</b>	<b>5.87</b>	<b>7.40</b>	<b>10/1/1992</b>
NCREIF Timberland Index	0.00	0.00	0.00	1.30	2.71	3.13	4.45			8.56	

Benchmark definitions on next page.

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*Periods Ended February 29, 2020*

	Performance (%)											Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception		
<b>Unlisted Infrastructure</b> Alternatives Custom Benchmark	0.00 0.72	-0.10 1.45	-0.10 1.45	9.54 9.00							9.24 9.00	4/1/2018
<b>Cash</b> 90 Day US Treasury Bill	0.26 0.15	0.52 0.28	0.52 0.28	5.65 2.18	3.31 1.73	2.19 1.11	1.18 0.59	2.10 1.70	3.38 2.84	3.88 3.28	7/1/1986	

# Benchmark Definitions

03/20/2020

Account Name	From Date	To Date	Benchmark
Domestic Equity Blended Benchmark	1/1/2015	Present	100% Russell 3000 Index
	1/1/1982	12/31/2014	100% Dow Jones US Total Stock Market Index
Real Estate Blended Benchmark	1/1/2013	Present	100% NCREIF Fund Index-ODCE (VW) (Net)** 100%
	1/1/2007	12/31/2012	100% NPI + 1%
	1/1/2005	12/31/2016	100% Consumer Price Index + 5%
Alternatives Custom Benchmark	7/1/2010	Present	100% Annualized rate of 9.0%
	1/1/2004	6/30/2010	100% Annualized rate of 12.0%
	1/1/2003	12/31/2003	100% Annualized rate of 13.0%
	2/1/1986	12/31/2002	100% Annualized rate of 15.0%
U.S. Equity IMRF Custom Benchmark			Blend of the U.S. Equity Style benchmarks returns, dollar weighted by the actual allocation at pervious month end.
International Equity IMRF Custom Benchmark			Blend of the the International Equity Style benchmarks returns, dollar weighted by the actual allocation at previous month end.
Fixed Income IMRF Custom Benchmark			Blend of the the Fixed Income Style benchmarks returns, dollar weighted by the actual allocation at previous month end.

\*\*ODCE returns are updated quarterly.  
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Account Name	From Date	To Date	Benchmark
Total Fund Benchmark			<p>The total fund benchmark is a blend of the asset class benchmark returns weighted by the target allocation for each asset class, currently:</p> <p>37% Russell 3000 Index, 28% Blmbg. Barc. U.S. Aggregate, 18% MSCI AC World ex USA (Net), 9% NCREIF Fund Index-ODCE (VW) (Net), 7% Alternatives Custom Benchmark, 1% 90 Day US Treasury Bill.</p>

# Investment Manager Asset Allocation

03/20/2020

Periods Ended February 29, 2020

	Jan-2020		Feb-2020	
	\$	%	\$	%
Domestic Equity	17,696,602,623	39.83	16,247,866,798	38.31
Large Cap Growth	5,974,166,699	13.45	5,609,880,848	13.23
NTGI S&P 500 Growth	2,601,358,068	5.86	2,414,312,690	5.69
Sands Capital	2,193,065,536	4.94	2,096,063,961	4.94
Piedmont Russell 1000 G	1,179,743,095	2.66	1,099,504,197	2.59
Large Cap Value	5,563,343,289	12.52	5,016,631,928	11.83
Dodge & Cox	1,399,337,278	3.15	1,275,225,034	3.01
BMO	922,744,470	2.08	826,648,006	1.95
LSV Asset	1,573,609,416	3.54	1,405,822,914	3.31
NTGI S&P 500 Value	1,667,652,125	3.75	1,508,935,974	3.56
Large Cap Pass. Core	2,619,169,056	5.90	2,404,854,277	5.67
NTGI MarketCap Idx.	2,619,169,056	5.90	2,404,854,277	5.67
Quantitative Factor Strategies	262,229,322	0.59	238,961,782	0.56
Quantitative US Equity - SciBeta	262,229,322	0.59	238,961,782	0.56
Small Cap Growth	784,626,483	1.77	728,652,703	1.72
Frontier Capital	600,195,871	1.35	560,620,722	1.32
FIAM Small Cap	184,430,612	0.42	168,031,981	0.40
Small Cap Value	1,486,444,345	3.35	1,331,441,664	3.14
Channing	232,157,584	0.52	207,688,110	0.49
DFA Small Cap Val.	560,660,374	1.26	500,887,608	1.18
Inv. Couns. Maryland	693,626,387	1.56	622,865,946	1.47
Micro Cap	433,328,866	0.98	390,417,236	0.92
DFA Micro Cap (9-10)	433,328,866	0.98	390,417,236	0.92

Page 269441

# Investment Manager Asset Allocation

03/20/2020

Periods Ended February 29, 2020

	Jan-2020		Feb-2020	
	\$	%	\$	%
Public Real Assets	573,294,563	1.29	527,026,360	1.24
Brookfield Public Global Infrastru	178,024,850	0.40	163,379,567	0.39
Cohen & St Public Global Infrastru	395,269,712	0.89	363,646,793	0.86
International Equity	8,357,590,405	18.81	7,610,929,509	17.95
Intl Large Cap Growth	1,412,617,162	3.18	1,216,456,468	2.87
EARNEST Part. Intl	581,450,141	1.31	442,800,093	1.04
William Blair	831,167,022	1.87	773,656,375	1.82
Intl Large Cap Value	1,297,254,140	2.92	1,186,427,366	2.80
Brandes Investment	615,485,188	1.39	556,007,027	1.31
Mondrian	560,110,539	1.26	518,788,169	1.22
Lazard	121,658,413	0.27	111,632,170	0.26
Intl Large Cap Core	3,976,013,079	8.95	3,657,355,351	8.62
Arrowstreet Capital	738,030,618	1.66	678,429,930	1.60
Brown Capital	376,945,606	0.85	345,849,553	0.82
GlobeFlex Capital	561,933,668	1.26	515,601,701	1.22
NTGI MSCI EAFE	1,959,719,010	4.41	1,807,553,129	4.26
Progress Intl Equity	339,384,177	0.76	309,921,037	0.73
Intl All Cap Developed	146,761,799	0.33	134,614,449	0.32
Ativo International	146,761,799	0.33	134,614,449	0.32
Internationall Small Cap	505,058,712	1.14	458,965,812	1.08
Franklin Templeton	196,531,943	0.44	176,706,453	0.42
William Blair IntSC	308,526,768	0.69	282,259,360	0.67

Page 269442

# Investment Manager Asset Allocation



03/20/2020

Periods Ended February 29, 2020

	Jan-2020		Feb-2020	
	\$	%	\$	%
Emerging Mkt Equity	1,019,885,513	2.30	957,110,063	2.26
Genesis Asset Mngrs.	1,019,885,513	2.30	957,110,063	2.26

# Investment Manager Asset Allocation

03/20/2020

Periods Ended February 29, 2020

	Jan-2020		Feb-2020	
	\$	%	\$	%
Fixed Income	12,775,077,996	28.75	12,904,687,801	30.43
Domestic Fixed Core	3,544,681,252	7.98	3,595,903,966	8.48
Brandes FI Core	371,527,290	0.84	375,226,261	0.88
EARNEST Partners	1,019,754,208	2.30	1,038,109,677	2.45
Piedmont Investment	1,083,728,959	2.44	1,098,642,391	2.59
Garcia Hamilton	1,069,670,794	2.41	1,083,925,637	2.56
Domestic Fixed Passive Core	3,612,526,441	8.13	3,677,304,984	8.67
NTGI Blmbg Agg.	1,844,759,608	4.15	1,877,450,766	4.43
BlackRock US Debt I	1,767,766,833	3.98	1,799,854,217	4.24
Domestic Fixed Core Plus	4,031,486,426	9.07	4,073,502,805	9.61
LM Capital Group FI	929,426,457	2.09	940,158,067	2.22
Progress Inv. FI	995,099,582	2.24	1,009,848,159	2.38
BMO - TCH	957,107,743	2.15	968,921,352	2.28
Western Asset	1,149,852,644	2.59	1,154,575,227	2.72
Bank Loans	572,196,186	1.29	562,914,075	1.33
Barings Global Loan Fund	572,196,186	1.29	562,914,075	1.33
Emerging Markets Debt	226,091,714	0.51	220,838,277	0.52
Standish Emerging Markets	226,091,714	0.51	220,838,277	0.52
High Yield	788,095,978	1.77	774,223,694	1.83
MacKay Shields	787,766,886	1.77	773,895,483	1.82
FIAM High Yield	329,092	0.00	328,211	0.00

Page 269444

# Investment Manager Asset Allocation

03/20/2020

Periods Ended February 29, 2020

	Jan-2020		Feb-2020	
	\$	%	\$	%
Real Estate	2,959,754,898	6.66	2,968,687,076	7.00
Real Estate Core Cmp	1,577,075,921	3.55	1,590,260,040	3.75
TA Assoc. Buckhead	605,428,300	1.36	623,609,054	1.47
Barings Core Property		0.00		0.00
Barings Euro Core Property	125,352,054	0.28	124,185,538	0.29
Blackstone Property Euro	129,021,010	0.29	127,885,865	0.30
INVECO Core Real Estate	214,400,464	0.48	214,400,464	0.51
INVECO European real estate	56,886,865	0.13	56,379,304	0.13
AEW Core Property Tr	241,362,936	0.54	239,175,524	0.56
CBRE Core Partners	204,624,292	0.46	204,624,292	0.48
RE Non-Core Cmp	1,382,678,977	3.11	1,378,427,035	3.25
Artemis MWBE Spruce	242,982,015	0.55	243,768,632	0.57
Franklin T. EMREFF	11,805,035	0.03	7,808,708	0.02
Security Capital	56,591,964	0.13	57,169,599	0.13
Dune II	21,982,160	0.05	22,643,881	0.05
Non-Core Real Estate Funds	891,507,627	2.01	882,772,768	2.08
Non-Core Intl Real Estate	157,267,314	0.35	164,107,294	0.39
Rockwood Fund VIII	168,181	0.00	156,152	0.00
Almanac ARS V	374,681	0.00	1	0.00
TA Assoc. - Fund IX		0.00		0.00
Alternatives Investments	2,503,355,707	5.63	2,548,968,258	6.01
Absolute Return	490,720	0.00	487,914	0.00
Aurora Investment	490,720	0.00	487,914	0.00

Page 269445



# Investment Manager Asset Allocation

Periods Ended February 29, 2020

	Jan-2020		Feb-2020	
	\$	%	\$	%
Private Equity	2,038,449,559	4.59	2,079,395,332	4.90
Abbott S/A Comp.	358,459,883	0.81	357,954,615	0.84
Muller Monroe MPEFF	5,104,385	0.01	4,808,888	0.01
Pantheon S/A Comp.	259,213,060	0.58	258,463,453	0.61
Private Equity Fund - Domestic	1,049,373,460	2.36	1,104,733,681	2.60
Private Equity Fund - International	359,596,454	0.81	346,732,377	0.82
Oakbrook Opportunities Fund	6,702,317	0.02	6,702,317	0.02
Private Credit	123,284,625	0.28	128,372,034	0.30
Private Credit Fund - Domestic	123,284,625	0.28	128,372,034	0.30
Agriculture	218,543,619	0.49	218,125,794	0.51
Premiere Partners IV	218,543,619	0.49	218,125,794	0.51
Timberland	76,057,702	0.17	76,057,702	0.18
Forest Investment	76,057,702	0.17	76,057,702	0.18
Unlisted Infrastructure	46,529,482	0.10	46,529,482	0.11
Unlisted Infrastructure Funds	46,529,482	0.10	46,529,482	0.11
Cash & Equivalents	136,895,415	0.31	128,211,176	0.30
<b>Total Fund</b>	<b>44,429,277,043</b>	<b>100.00</b>	<b>42,409,350,618</b>	<b>100.00</b>

Periods Ended February 29, 2020

	Performance (%)										Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception			
<b>Total Fund</b>	-4.30	-4.58	-4.58	5.76	7.04	6.05	8.59	9.72	1/1/1982		
Total Fund - Net	-4.33	-4.62	-4.62	5.58	6.85	5.83	8.36				
Total Fund Benchmark	-3.90	-3.83	-3.83	6.94	6.93	6.16	8.26				
<b>Domestic Equity</b>	-8.16	-8.95	-8.95	3.19	8.01	7.76	12.10	11.34	1/1/1982		
Domestic Equity - Net	-8.21	-9.01	-9.01	2.99	7.80	7.53	11.84				
Blended Benchmark	-8.19	-8.29	-8.29	6.90	9.28	8.72	12.49	11.28			
Russell 3000 Index	-8.19	-8.29	-8.29	6.90	9.28	8.72	12.48				
<b>Large Cap Equity</b>	-7.91	-8.12	-8.12	5.43	9.26	8.58	12.53	11.05	1/1/1982		
Large Cap Equity - Net	-7.92	-8.14	-8.14	5.35	9.14	8.46	12.39				
Russell 1000 Index	-8.17	-8.07	-8.07	7.82	9.73	9.00	12.64	11.43			
<b>Large Cap Growth</b>	-6.10	-3.29	-3.29	11.69	16.46	11.94	14.47	11.90	1/1/1982		
Large Cap Growth - Net	-6.12	-3.31	-3.31	11.59	16.33	11.80	14.30				
LCG Blended Benchmark	-6.81	-4.73	-4.73	15.11	15.67	12.41	14.79				
Russell 1000 Growth Index	-6.81	-4.73	-4.73	15.11	15.67	12.41	14.79	11.13			
<b>NTGI S&amp;P 500 Growth</b>	-7.19	-5.08	-5.08	11.27	13.92	11.41	14.41	7.88	8/1/2001		
NTGI S&P 500 Growth - Net	-7.19	-5.08	-5.08	11.26	13.91	11.40	14.40				
S&P 500 Growth	-7.15	-5.04	-5.04	11.27	13.97	11.42	14.40	7.85			
<b>Piedmont Russell 1000 G</b>	-6.80	-4.72	-4.72	15.08	20.05	12.73	17.25	12.30	11/1/2003		
Piedmont Russell 1000 G - Net	-6.81	-4.72	-4.72	15.06	19.79	12.48	16.98				
Russell 1000 Growth Index	-6.81	-4.73	-4.73	15.11	15.67	12.41	14.79	9.94			
<b>Sands Capital</b>	-4.42	-0.34	-0.34	10.46	20.05	12.73	17.25	12.30	11/1/2003		
Sands Capital - Net	-4.47	-0.39	-0.39	10.22	19.79	12.48	16.98				
LCG Blended Benchmark	-6.81	-4.73	-4.73	15.11	15.67	12.41	14.79	9.94			
Russell 1000 Growth Index	-6.81	-4.73	-4.73	15.11	15.67	12.41	14.79	9.99			
<b>Large Cap Value</b>	-9.73	-12.87	-12.87	-1.24	3.92	5.82	10.99	9.98	10/1/1982		
Large Cap Value - Net	-9.74	-12.90	-12.90	-1.38	3.76	5.65	10.81				
LCV Blended Benchmark	-9.68	-11.63	-11.63	0.54	3.78	5.51	10.40	11.50			
Russell 1000 Value Index	-9.68	-11.63	-11.63	0.54	3.78	5.51	10.40				

Benchmark definitions in glossary.

Periods Ended February 29, 2020

	Performance (%)										Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception			
<b>Dodge &amp; Cox</b>	-8.78	-11.63	-11.63	-0.26	4.85	7.10	11.46	8.86	8.86	9/1/2003	
Dodge & Cox - Net	-8.83	-11.68	-11.68	-0.47	4.63	6.87	11.23				
LCV Blended Benchmark	-9.68	-11.63	-11.63	0.54	3.78	5.51	10.40	7.74	7.74		
Russell 1000 Value Index	-9.68	-11.63	-11.63	0.54	3.78	5.51	10.40	7.90	7.90		
<b>BMO</b>	-10.30	-12.81	-12.81	-6.34	2.44	4.33	10.62	7.29	7.29	2/1/2001	
BMO - Net	-10.30	-12.81	-12.81	-6.51	2.23	4.11	10.38				
LCV Blended Benchmark	-9.68	-11.63	-11.63	0.54	3.78	5.51	10.40	5.32	5.32		
Russell 1000 Value Index	-9.68	-11.63	-11.63	0.54	3.78	5.51	10.40	6.29	6.29		
<b>LSV Asset</b>	-10.48	-15.05	-15.05	-4.10	2.77	5.16	11.00	10.01	10.01	2/1/2003	
LSV Asset - Net	-10.48	-15.10	-15.10	-4.32	2.54	4.91	10.73				
LCV Blended Benchmark	-9.68	-11.63	-11.63	0.54	3.78	5.51	10.40	8.65	8.65		
Russell 1000 Value Index	-9.68	-11.63	-11.63	0.54	3.78	5.51	10.40	8.66	8.66		
<b>NTGI S&amp;P 500 Value</b>	-9.52	-11.87	-11.87	4.74	5.37	6.68	10.74	5.64	5.64	8/1/1999	
NTGI S&P 500 Value - Net	-9.52	-11.87	-11.87	4.73	5.36	6.67	10.74				
S&P 500 Value	-9.51	-11.90	-11.90	4.70	5.31	6.61	10.67	5.61	5.61		
<b>Large Cap Pass. Core</b>	-8.18	-8.29	-8.29	6.83	9.29	8.75	12.51	10.96	10.96	1/1/1985	
Large Cap Pass. Core - Net	-8.18	-8.29	-8.29	6.83	9.28	8.74	12.50				
Dow Jones US Total Stock Market Index	-8.19	-8.30	-8.30	6.77	9.22	8.66	12.46				
<b>NTGI MarketCap Idx.</b>	-8.18	-8.29	-8.29	6.83	9.29	8.75	12.52	10.74	10.74	2/1/1985	
NTGI MarketCap Idx. - Net	-8.18	-8.29	-8.29	6.83	9.28	8.74	12.51				
Dow Jones US Total Stock Market Index	-8.19	-8.30	-8.30	6.77	9.22	8.66	12.46				
<b>Quantitative Factor Strategies</b>	-8.87	-9.37	-9.37					-4.26	-4.26	9/17/2019	
<b>Quantitative US Equity - SciBeta</b>	-8.87	-9.37	-9.37					-4.26	-4.26	9/17/2019	
Quantitative US Equity - SciBeta - Net	-8.87	-9.37	-9.37					-4.26	-4.26		
SciBeta U.S. High-Factor-Intensity Diversified Multi-Beta Multi-Strategy Index	-8.89	-9.32	-9.32					-4.54	-4.54		
<b>Small Cap Composite</b>	-9.39	-13.59	-13.59	-7.56	2.78	4.39	10.56	11.55	11.55	7/1/1988	
Small Cap Composite - Net	-9.61	-13.80	-13.80	-8.14	2.22	3.81	9.96	9.02	9.02		
Russell 2000 Index	-8.42	-11.36	-11.36	-4.92	3.52	5.12	10.41				

Periods Ended February 29, 2020

	Performance (%)										Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception			
<b>Small Cap Growth</b>	-7.13	-9.43	-9.43	-0.84	8.26	6.71	12.15	12.63	7/1/1988		
Small Cap Growth - Net	-7.63	-9.91	-9.91	-1.72	7.61	6.07	11.52	7.92			
Russell 2000 Growth Index	-7.22	-8.24	-8.24	-0.72	7.85	6.48	12.07				
<b>Frontier Capital</b>	-6.59	-9.24	-9.24	-2.30	13.34	7.84	12.53	12.93	8/1/1988		
Frontier Capital - Net	-7.25	-9.88	-9.88	-3.34	12.46	7.09	11.82				
Russell 2000 Growth Index	-7.22	-8.24	-8.24	-0.72	7.85	6.48	12.07	8.00			
<b>FIAM Small Cap</b>	-8.89	-10.04	-10.04	-0.20	5.93	6.73	12.34	13.11	8/1/1988		
FIAM Small Cap - Net	-8.89	-10.04	-10.04	-0.59	5.56	6.25	11.80				
Russell 2000 Index	-8.42	-11.36	-11.36	-4.92	3.52	5.12	10.41	9.08			
Russell 2000 Growth Index	-7.22	-8.24	-8.24	-0.72	7.85	6.48	12.07	8.00			
<b>Small Cap Value</b>	-10.43	-15.34	-15.34	-10.06	-0.36	3.92	9.66	11.05	9/1/1989		
Small Cap Value - Net	-10.54	-15.45	-15.45	-10.52	-0.88	3.38	9.13	9.42			
Russell 2000 Value Index	-9.72	-14.59	-14.59	-9.29	-0.83	3.61	8.67				
<b>Channing</b>	-10.54	-14.27	-14.27	-9.09	-1.38	3.06		8.20	7/1/2011		
Channing - Net	-10.66	-14.39	-14.39	-9.54	-1.88	2.55		7.61			
Russell 2000 Value Index	-9.72	-14.59	-14.59	-9.29	-0.83	3.61		7.05			
<b>DFA Small Cap Val.</b>	-10.66	-16.91	-16.91	-14.10	-2.92	1.86	9.37	10.87	2/1/1996		
DFA Small Cap Val. - Net	-10.79	-17.03	-17.03	-14.55	-3.43	1.34	8.84				
Russell 2000 Value Index	-9.72	-14.59	-14.59	-9.29	-0.83	3.61	8.67	8.76			
<b>Inv. Couns. Maryland</b>	-10.20	-14.40	-14.40	-6.86	2.36	6.66	10.53	10.64	5/1/1999		
Inv. Couns. Maryland - Net	-10.29	-14.49	-14.49	-7.35	1.83	6.11	10.02				
Russell 2000 Value Index	-9.72	-14.59	-14.59	-9.29	-0.83	3.61	8.67	8.20			
<b>Micro Cap</b>	-9.90	-14.86	-14.86	-10.61	0.68	1.77	9.79	10.91	7/1/1984		
Micro Cap - Net	-10.03	-14.98	-14.98	-11.07	0.14	1.16	9.10				
Russell Microcap Index	-6.84	-11.18	-11.18	-6.69	2.44	3.87	9.77				
<b>DFA Micro Cap (9-10)</b>	-9.90	-14.86	-14.86	-10.61	1.41	4.96	11.13	10.51	8/1/1987		
DFA Micro Cap (9-10) - Net	-10.03	-14.98	-14.98	-11.07	0.91	4.44	10.59				
Russell 2000 Index	-8.42	-11.36	-11.36	-4.92	3.52	5.12	10.41	8.44			

Periods Ended February 29, 2020

	Performance (%)										Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception			
<b>Public Real Assets</b>	-8.07	-6.39	-6.39	6.60				6.39	8/1/2017		
Public Real Assets - Net	-8.18	-6.50	-6.50	6.12				5.93			
Public Real Assets Benchmark	-8.62	-7.05	-7.05	5.19				4.33			
<b>Brookfield</b>	-8.23	-7.31	-7.31	4.46				3.48	8/1/2017		
Brookfield - Net	-8.35	-7.44	-7.44	3.92				2.96			
Dow Jones Brookfield Global Infrastructure Composite Index	-8.00	-7.28	-7.28	4.33				2.63			
<b>Cohen &amp; Steers</b>	-8.00	-5.97	-5.97	7.60				7.80	8/1/2017		
Cohen & Steers - Net	-8.10	-6.07	-6.07	7.15				7.37			
FTSE Global Core Infrastructure 50/50 Index (Net)	-8.93	-6.93	-6.93	5.61				5.17			

Periods Ended February 29, 2020

	Performance (%)										Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception			
<b>International Equity</b>	-7.85	-10.44	-10.44	0.64	5.02	3.23	5.97	7.47	9/1/1986		
International Equity - Net	-7.90	-10.51	-10.51	0.34	4.68	2.89	5.64				
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34				
<b>Intl Large Cap Equity</b>	-8.01	-10.50	-10.50	0.03	4.62	2.94	5.88	7.45	9/1/1986		
Intl Large Cap Equity - Net	-8.06	-10.56	-10.56	-0.22	4.35	2.66	5.61				
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34				
<b>Intl Large Cap Grwth</b>	-7.53	-9.51	-9.51	3.96	5.95	3.47	6.32	7.90	9/1/2002		
Intl Large Cap Grwth - Net	-7.58	-9.57	-9.57	3.71	5.69	3.20	5.98				
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34	6.76			
MSCI AC World ex USA Growth (Net)	-7.30	-8.19	-8.19	5.79	7.57	4.28	5.83	7.21			
<b>EARNEST Part. Intl</b>	-8.40	-12.10	-12.10	-2.66	3.19	2.06	5.00	8.13	10/1/2004		
EARNEST Part. Intl - Net	-8.40	-12.15	-12.15	-2.76	3.02	1.88	4.72				
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34	5.34			
MSCI AC World ex USA Growth (Net)	-7.30	-8.19	-8.19	5.79	7.57	4.28	5.83	6.25			
<b>William Blair</b>	-6.92	-7.63	-7.63	9.40	8.24	4.62	7.86	9.32	10/1/2002		
William Blair - Net	-7.00	-7.71	-7.71	9.02	7.86	4.25	7.47				
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34	7.48			
MSCI AC World ex USA Growth (Net)	-7.30	-8.19	-8.19	5.79	7.57	4.28	5.83	7.82			
<b>Intl Large Cap Val.</b>	-8.54	-12.31	-12.31	-4.58	2.48	1.50	4.38	8.13	10/1/1995		
Intl Large Cap Val. - Net	-8.61	-12.38	-12.38	-4.87	2.15	1.14	4.03				
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34				
MSCI AC World ex USA Value	-8.52	-12.56	-12.56	-6.45	1.37	0.61	3.39				
<b>Brandes Investment</b>	-9.66	-14.06	-14.06	-8.25	0.94	0.82	4.33	8.16	1/1/1996		
Brandes Investment - Net	-9.71	-14.10	-14.10	-8.45	0.73	0.59	4.09				
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34				
MSCI AC World ex USA Value	-8.52	-12.56	-12.56	-6.45	1.37	0.61	3.39				
<b>Mondrian</b>	-7.38	-10.92	-10.92	-1.54	3.65	2.08	4.46	4.46	4/1/2012		
Mondrian - Net	-7.48	-11.01	-11.01	-1.96	3.17	1.58	3.96	3.96			
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.00	4.00			
MSCI AC World ex USA Value	-8.52	-12.56	-12.56	-6.45	1.37	0.61	2.98	2.98			

Periods Ended February 29, 2020

	Performance (%)										Inception Date	
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception				
<b>Lazard</b>												
Lazard - Net	-8.24	-9.76	-9.76	1.05	5.42	2.47		5.35	4/1/2012			
MSCI AC World ex USA (Net)	-8.30	-9.82	-9.82	0.80	5.16	2.06		4.83				
MSCI AC World ex USA Value	-7.90	-10.38	-10.38	-0.69	4.15	2.18		4.00				
	-8.52	-12.56	-12.56	-6.45	1.37	0.61		2.98				
<b>Intl Large Cap Active Core</b>												
Intl Large Cap Active Core - Net	-8.24	-10.40	-10.40	-0.24	5.19	4.13	7.37	4.23	2/1/2008			
MSCI AC World ex USA (Net)	-8.34	-10.50	-10.50	-0.69	4.72	3.61	6.84	1.81				
	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34					
<b>Arrowstreet Capital</b>												
Arrowstreet Capital - Net	-8.08	-10.58	-10.58	0.36	5.28	4.29	7.64	4.48	3/1/2008			
MSCI AC World ex USA (Net)	-8.19	-10.69	-10.69	-0.11	4.79	3.81	7.13	3.99				
	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34	1.58				
<b>Brown Capital</b>												
Brown Capital - Net	-8.25	-8.51	-8.51	3.05	6.32	4.30	7.29	7.39	10/1/2004			
MSCI AC World ex USA (Net)	-8.31	-8.57	-8.57	2.76	5.85	3.53	6.52	5.34				
	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34					
<b>Globeflex Capital</b>												
Globeflex Capital - Net	-8.25	-11.10	-11.10	-3.84	3.19	3.36	6.70	4.14	3/1/2006			
MSCI AC World ex USA (Net)	-8.35	-11.20	-11.20	-4.26	2.79	2.95	6.27	3.69				
	-7.90	-10.38	-10.38	-0.69	4.15	2.18	4.34	3.20				
<b>Progress Intl Equity</b>												
Progress Intl Equity - Net	-8.55	-10.92	-10.92	1.71	7.56	4.95		3.83	7/1/2014			
Custom Benchmark (Progress Intl Equity)	-8.67	-11.03	-11.03	1.09	6.99	4.41		3.33				
MSCI AC World ex USA (Net)	-7.90	-10.38	-10.38	-0.69	4.72	3.13		2.05				
	-7.90	-10.38	-10.38	-0.69	4.15	2.18		1.15				
<b>Intl Large Cap Passive Core</b>												
Intl Large Cap Passive Core - Net	-7.76	-10.10	-10.10	0.72	4.58	2.51	5.32	3.12	1/1/2000			
MSCI EAFE Index (Net)	-7.76	-10.11	-10.11	0.72	4.57	2.50	5.31	2.70				
	-9.04	-10.94	-10.94	-0.57	3.92	1.96	4.83					
<b>NTGI MSCI EAFE</b>												
NTGI MSCI EAFE - Net	-7.76	-10.10	-10.10	0.72	4.58	2.51	5.32	3.46	2/1/2000			
MSCI EAFE Index (Net)	-7.76	-10.11	-10.11	0.72	4.57	2.50	5.31	3.04				
	-9.04	-10.94	-10.94	-0.57	3.92	1.96	4.83					
<b>Intl All Cap Developed</b>												
Intl All Cap Developed - Net	-8.28	-9.44	-9.44	2.81				3.99	2/1/2019			
MSCI EAFE + Canada (Net)	-8.28	-9.56	-9.56	2.34				3.55				
	-8.88	-10.64	-10.64	-0.39				2.00				

Benchmark definitions in glossary.

Periods Ended February 29, 2020

	Performance (%)										Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception			
<b>Ativo International</b>	-8.28	-9.44	-9.44	2.81				3.99	2/1/2019		
Ativo International - Net	-8.28	-9.56	-9.56	2.34				3.55			
MSCI EAFE + Canada (Net)	-8.88	-10.64	-10.64	-0.39				2.00			
<b>Intl Small Cap Eqty</b>	-9.13	-11.92	-11.92	2.42	5.06	4.31	7.40	4.27	12/1/2005		
Intl Small Cap Eqty - Net	-9.20	-11.99	-11.99	1.78	4.29	3.55	6.62				
MSCI AC World ex USA Small Cap (Net)	-9.20	-12.03	-12.03	-2.18	2.86	3.31	5.80	5.30			
Custom Benchmark (Intl Small Cap)	-9.20	-12.03	-12.03	-2.18	2.86	3.31	5.87	4.59			
<b>Franklin Templeton</b>	-10.09	-14.56	-14.56	-6.42	3.68	2.98		4.70	8/1/2011		
Franklin Templeton - Net	-10.27	-14.74	-14.74	-7.12	2.86	2.23		3.95			
MSCI AC World ex USA Small Cap (Net)	-9.20	-12.03	-12.03	-2.18	2.86	3.31		3.57			
<b>William Blair IntSC</b>	-8.51	-10.18	-10.18	8.75	5.93	5.26		8.42	9/1/2010		
William Blair IntSC - Net	-8.51	-10.18	-10.18	8.15	5.19	4.50		7.61			
MSCI AC World ex USA Small Cap (Net)	-9.20	-12.03	-12.03	-2.18	2.86	3.31		5.80			
Custom Benchmark (Intl Small Cap)	-9.20	-12.03	-12.03	-2.18	2.86	3.31		6.11			
<b>Emerging Mkt Equity</b>	-6.11	-9.45	-9.45	3.80	8.16	4.94	5.88	8.81	2/1/1992		
Emerging Mkt Equity - Net	-6.16	-9.56	-9.56	3.26	7.53	4.32	5.26				
MSCI Emerging Markets Index	-5.27	-9.68	-9.68	-1.51	5.28	3.11	3.54	6.76			
<b>Genesis Asset Mngrs.</b>	-6.11	-9.45	-9.45	3.80	8.16	4.94	5.88	10.65	5/1/2004		
Genesis Asset Mngrs. - Net	-6.16	-9.56	-9.56	3.26	7.53	4.32	5.26				
MSCI Emerging Markets Index	-5.27	-9.68	-9.68	-1.51	5.28	3.11	3.54	8.25			



Periods Ended February 29, 2020

	Performance (%)										Inception Date	
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception				
<b>Fixed Income</b>												
Fixed Income - Net	1.22	3.04	3.04	10.88	5.23	4.09	4.85	8.24			1/1/1982	
Bimbg. Barc. U.S. Aggregate	1.20	3.01	3.01	10.74	5.08	3.94	4.70					
	1.80	3.76	3.76	11.68	5.01	3.58	3.93	7.74				
<b>Active Fixed Core</b>												
ActiveCore Fixed Inc - Net	1.77	4.01	4.01	11.33	5.14	3.86	4.52	4.75			4/1/2001	
Bimbg. Barc. U.S. Aggregate	1.75	3.98	3.98	11.22	5.04	3.74	4.37					
	1.80	3.76	3.76	11.68	5.01	3.58	3.93	4.75				
<b>Brandes FI Core</b>												
Brandes FI Core - Net	1.66	3.58	3.58	9.93	4.49						3/1/2016	
Bimbg. Barc. U.S. Aggregate	1.66	3.58	3.58	9.93	4.49							
	1.80	3.76	3.76	11.68	5.01			4.10				
<b>EARNEST Partners</b>												
EARNEST Partners - Net	2.08	4.54	4.54	12.35	5.56	4.02	4.60	4.86			5/1/2005	
Bimbg. Barc. U.S. Aggregate	2.08	4.50	4.50	12.21	5.41	3.85	4.41	4.66				
	1.80	3.76	3.76	11.68	5.01	3.58	3.93	4.40				
<b>Piedmont Investment</b>												
Piedmont Investment - Net	1.72	4.14	4.14	11.76	5.00	3.84	4.51	4.60			6/1/2005	
Bimbg. Barc. U.S. Aggregate	1.69	4.10	4.10	11.62	4.85	3.69	4.35	4.42				
	1.80	3.76	3.76	11.68	5.01	3.58	3.93	4.35				
<b>Garcia Hamilton</b>												
Garcia Hamilton - Net	1.55	3.52	3.52	10.45	5.01			4.09			6/1/2015	
Bimbg. Barc. U.S. Aggregate	1.54	3.50	3.50	10.37	4.92			3.99				
	1.80	3.76	3.76	11.68	5.01			3.80				
<b>Pass. Core Fixed Inc</b>												
Pass. Core Fixed Inc - Net	1.79	3.78	3.78	11.74	5.08	3.64	3.97	6.02			1/1/1990	
Bimbg. Barc. U.S. Aggregate	1.79	3.77	3.77	11.73	5.07	3.63	3.96					
	1.80	3.76	3.76	11.68	5.01	3.58	3.93	6.01				
<b>BlackRock US Debt I</b>												
BlackRock US Debt I - Net	1.82	3.78	3.78	11.75	5.11	3.67	3.99	3.99			10/1/2013	
Bimbg. Barc. U.S. Aggregate	1.81	3.77	3.77	11.74	5.11	3.67	3.99	3.99				
	1.80	3.76	3.76	11.68	5.01	3.58	3.87	3.87				
<b>NTGI Bimbg Agg.</b>												
NTGI Bimbg Agg. - Net	1.77	3.77	3.77	11.73	5.05	3.61	3.95	6.08			2/1/1990	
Bimbg. Barc. U.S. Aggregate	1.77	3.77	3.77	11.72	5.04	3.60	3.95	6.07				
	1.80	3.76	3.76	11.68	5.01	3.58	3.93					

Periods Ended February 29, 2020

	Performance (%)										Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception			
<b>Core Plus Fixed Income</b>	<b>1.29</b>	<b>3.27</b>	<b>3.27</b>	<b>11.73</b>	<b>5.40</b>	<b>4.17</b>	<b>4.98</b>	<b>8.11</b>	<b>1/1/1982</b>		
Core Plus Fixed Inc. - Net	1.26	3.22	3.22	11.54	5.21	3.99	4.79	8.11	1/1/1982		
Bimbg. Barc. U.S. Aggregate	1.80	3.76	3.76	11.68	5.01	3.58	3.93	7.74			
<b>LM Capital Group FI</b>	<b>1.61</b>	<b>3.71</b>	<b>3.71</b>	<b>11.66</b>	<b>5.04</b>	<b>3.91</b>	<b>4.62</b>	<b>5.09</b>	<b>5/1/2005</b>		
LM Capital Group FI - Net	1.61	3.67	3.67	11.49	4.87	3.75	4.45	4.92	5/1/2005		
Bimbg. Barc. U.S. Aggregate	1.80	3.76	3.76	11.68	5.01	3.58	3.93	4.40			
<b>Progress Inv. FI</b>	<b>1.48</b>	<b>3.47</b>	<b>3.47</b>	<b>11.58</b>	<b>5.39</b>	<b>4.09</b>	<b>4.66</b>	<b>5.16</b>	<b>1/1/2006</b>		
Progress Inv. FI - Net	1.40	3.39	3.39	11.22	5.05	3.76	4.31	4.81	1/1/2006		
Bimbg. Barc. U.S. Aggregate	1.80	3.76	3.76	11.68	5.01	3.58	3.93	4.50			
<b>BMO - TCH</b>	<b>1.51</b>	<b>3.43</b>	<b>3.43</b>	<b>11.04</b>	<b>5.39</b>	<b>4.32</b>	<b>5.22</b>	<b>5.22</b>	<b>5/1/2005</b>		
BMO - TCH - Net	1.48	3.40	3.40	10.90	5.25	4.19	5.08	5.09	5/1/2005		
Bimbg. Barc. U.S. Aggregate	1.80	3.76	3.76	11.68	5.01	3.58	3.93	4.40			
<b>Western Asset</b>	<b>0.69</b>	<b>2.61</b>	<b>2.61</b>	<b>12.51</b>	<b>5.98</b>	<b>4.73</b>	<b>5.56</b>	<b>5.66</b>	<b>11/1/2001</b>		
Western Asset - Net	0.66	2.58	2.58	12.40	5.85	4.60	5.42	5.66	11/1/2001		
Bimbg. Barc. U.S. Aggregate	1.80	3.76	3.76	11.68	5.01	3.58	3.93	4.50			
<b>Bank Loans</b>	<b>-1.60</b>	<b>-1.01</b>	<b>-1.01</b>	<b>3.34</b>	<b>3.95</b>	<b>4.53</b>	<b>4.37</b>	<b>4.37</b>	<b>8/1/2014</b>		
Bank Loans - Net	-1.60	-1.01	-1.01	3.18	3.55	4.04	3.87	4.37	8/1/2014		
Custom Benchmark	-1.24	-0.68	-0.68	3.72	4.05	4.26	4.01	4.01			
<b>Barings Global Loan Fund</b>	<b>-1.60</b>	<b>-1.01</b>	<b>-1.01</b>	<b>3.34</b>	<b>3.95</b>	<b>4.53</b>	<b>4.37</b>	<b>4.37</b>	<b>8/1/2014</b>		
Barings Global Loan Fund - Net	-1.60	-1.01	-1.01	3.18	3.55	4.04	3.87	4.37	8/1/2014		
Custom Benchmark	-1.24	-0.68	-0.68	3.72	4.05	4.26	4.01	4.01			
<b>Emerging Markets Debt</b>	<b>-2.32</b>	<b>-2.14</b>	<b>-2.14</b>	<b>6.96</b>	<b>4.77</b>	<b>3.97</b>	<b>3.02</b>	<b>3.02</b>	<b>8/1/2014</b>		
Emerging Markets Debt - Net	-2.41	-2.23	-2.23	6.59	4.41	3.61	2.68	3.02	8/1/2014		
Custom Benchmark	-1.86	-1.66	-1.66	7.17	4.88	4.08	2.47	2.47			
<b>Standish Emerging Markets</b>	<b>-2.32</b>	<b>-2.14</b>	<b>-2.14</b>	<b>6.96</b>	<b>4.77</b>	<b>3.97</b>	<b>3.02</b>	<b>3.02</b>	<b>8/1/2014</b>		
Standish EM MRK - Net	-2.41	-2.23	-2.23	6.59	4.41	3.61	2.68	3.02	8/1/2014		
Custom Benchmark	-1.86	-1.66	-1.66	7.17	4.88	4.08	2.47	2.47			



Periods Ended February 29, 2020

	Performance (%)										Inception Date
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception			
<b>High Yield</b>	-1.20	-1.29	-1.29	7.58	5.74	6.17	7.59	9.47	4/1/1986		
High Yield - Net	-1.28	-1.38	-1.38	7.15	5.39	5.79	7.20				
ICE BofAML US High Yield, Cash Pay Index	-1.54	-1.54	-1.54	5.91	4.76	5.15	7.14	8.23			
<b>MacKay Shields</b>	-1.20	-1.29	-1.29	7.58	5.73	6.35	7.71	8.73	11/1/2000		
MacKay Shields - Net	-1.28	-1.38	-1.38	7.15	5.37	5.97	7.33				
ICE BofAML US High Yield, Cash Pay Index	-1.54	-1.54	-1.54	5.91	4.76	5.15	7.14	7.45			

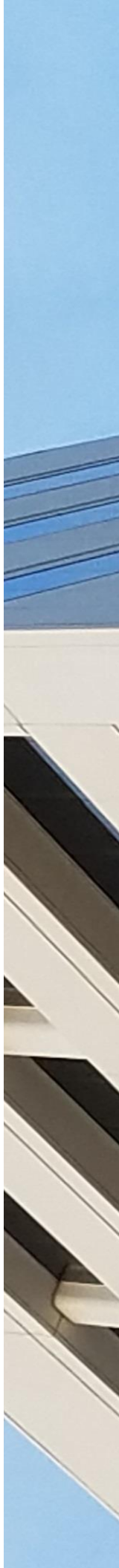
# Benchmark History

Account Name	From Date	To Date	Benchmark
Total Fund			<p>The total fund benchmark is a blend of the asset class benchmark returns weighted by the target allocation for each asset class, currently:</p> <p>37% Russell 3000 Index, 28% Blmbg. Barc. U.S. Aggregate, 18% MSCI AC World ex USA (Net), 9% NCREIF Fund Index-ODCE (VW) (Net), 7% Alternatives Custom Benchmark, 1% 90 Day US Treasury Bill.</p>
Domestic Equity	1/1/2015	Present	100% Russell 3000 Index
	1/1/1982	12/31/2014	100% Dow Jones US Total Stock Market Index
Large Cap Growth	1/1/2006	Present	100% Russell 1000 Growth Index
	11/1/2003	12/31/2005	100% S&P 500 Growth
Large Cap Value	1/1/2006	Present	100% Russell 1000 Value Index
	2/1/2001	12/31/2005	100% S&P 500 Value
Public Real Assets	8/1/2017	Present	33.3% Dow Jones Brookfield Global Infrastructure Composi, 66.7% FTSE GLOBAL CORE INFRASTRUCTURE 50/50 INDEX (Net)
Progress Intl Equity	12/1/2017	Present	100% MSCI AC World ex USA (Net)
	7/1/2014	11/30/2017	Custom blended weighted average of the underlying managers' individual MSCI benchmarks

# Benchmark History

03/20/2020

Account Name	From Date	To Date	Benchmark
Intl Small Cap Eqty	6/1/2011	Present	100% MSCI AC World ex USA Small Cap (Net)
	12/1/2005	5/31/2011	100% S&P Developed Ex-U.S. SmallCap (Net)
Barings Global Loan Fund	8/1/2014	Present	Comprised of the Credit Suisse US Leveraged Loan Index and the Credit Suisse Western European Leveraged Loan Index, weighted by the portfolio's market value to each sector.
Standish Emerging Markets	8/1/2014	Present	50% JPM GBI-EM Global Diversified, 25% JPM EMBI Global (USD), 25% JPM CEMBI Broad Index



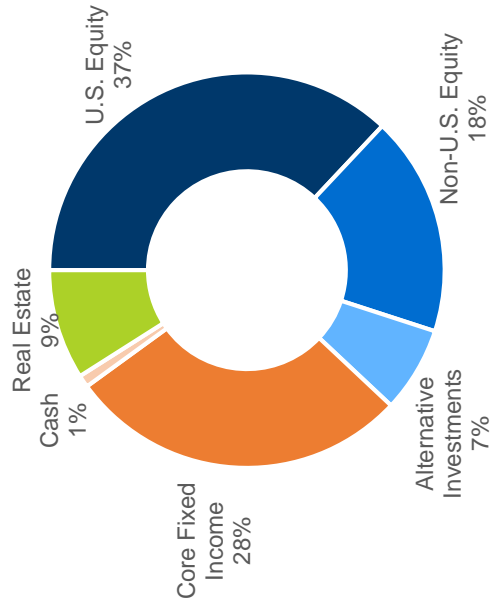
# Diversification Review

# ASSET ALLOCATION

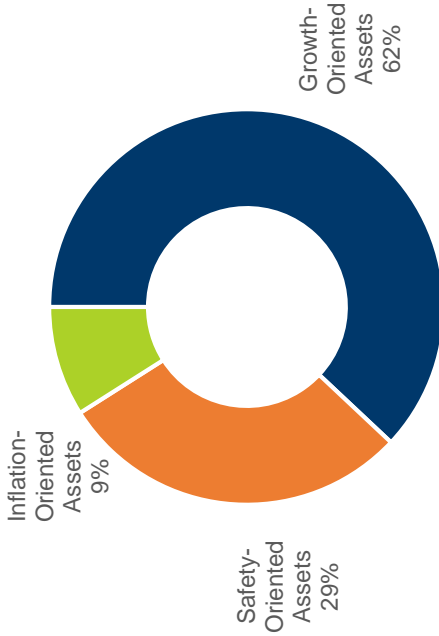
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- The goal of asset allocation is to select a diversified mix of suitable asset classes that minimizes risk for a given level of expected return.
- The purpose of the exercise is to build a portfolio that can help to meet the financial goals of the investor.

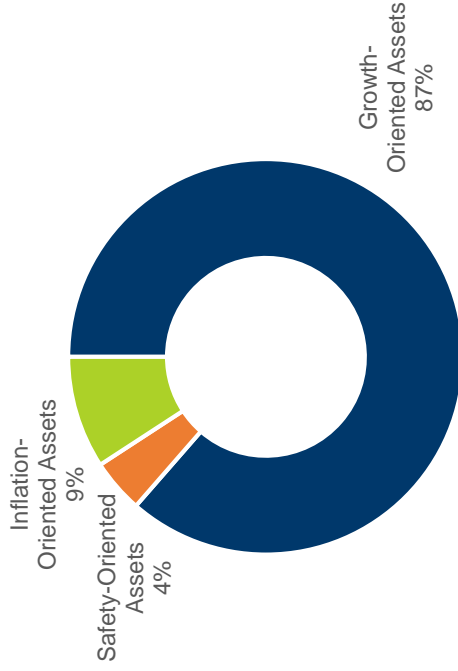
Capital Allocation - Asset Classes



Capital Allocation - Bucketing



Risk Allocation\*



\*85% of Alternative Investments included in Growth-Oriented Assets, representing Private Equity and Private Credit; 15% included in Inflation-Oriented Assets, representing Agriculture, Timberland and Infrastructure  
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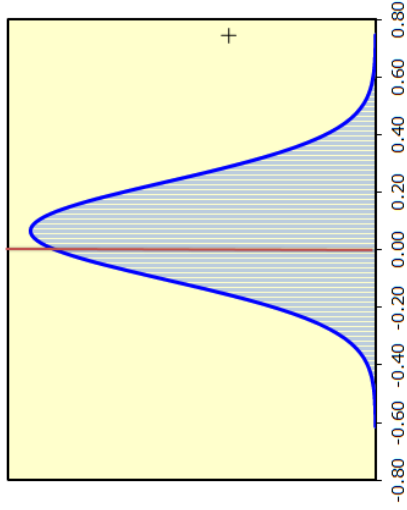
# ASSET CLASS EXPECTATIONS



## Median Return

- 50% probability that the return will be greater than the expected return.
- 50% probability that it will be less than the expected return.

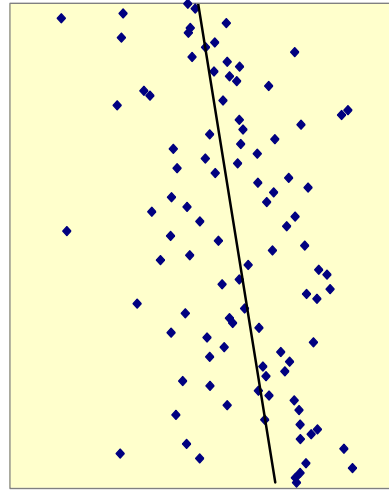
Distribution of U.S. Equity Geometric Return  
 Median Return = 6.5%, Expected Risk = 17.00%



Measures the dispersion of asset class returns around the expected return.

Measures the movement of asset class returns in relation to one another.

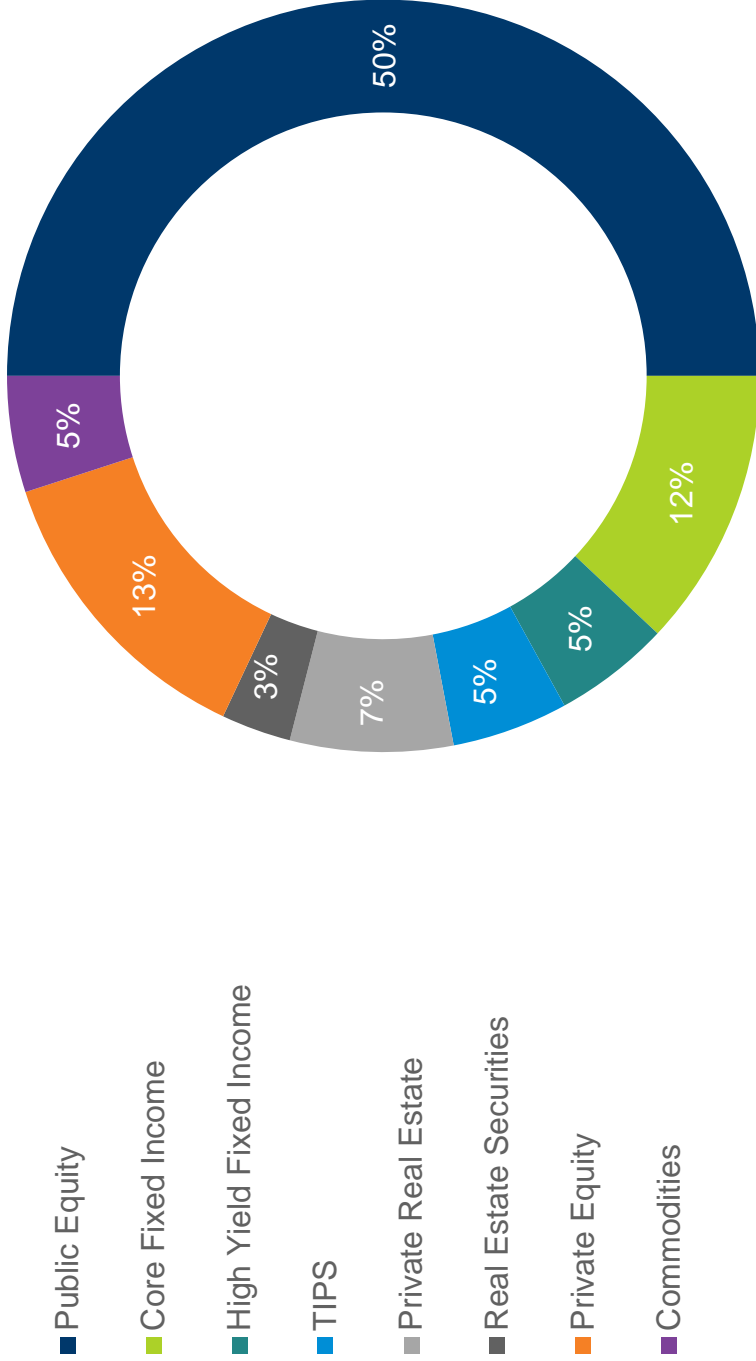
Correlation = .35





# WHAT HAPPENED IN 2008?

03/20/2020



Allocation as of 12/31/2007

- The expected one-year return in 2008 for this portfolio was 8.16% with volatility of 11.67%
- Hypothetical worst case (99% confidence) return based on Wilshire assumptions was -15.67%.
- Actual return was -29.68%

Page 269462

# CORRELATION CONVERGENCE

03/20/2020

The theoretical underpinning of diversification is presumed low correlations among asset classes.

Asset Class	Allocation	Expected Correlation with Public Equity	Actual Correlation with Public Equity 2007-2009
<b>Correlations</b>			
Core Fixed Income	12%	0.19	-0.10
High Yield Fixed Income	5%	0.45	0.87
TIPS	5%	-0.01	0.19
Private Real Estate	7%	0.32	0.14
Real Estate Securities	3%	0.33	0.85
Private Equity	13%	0.76	0.80
Commodities	5%	0.10	0.65
<b>Risk (Volatility)</b>		11.67%	12.35%
<b>"Worst case" return</b>		-9.29%	-10.28%

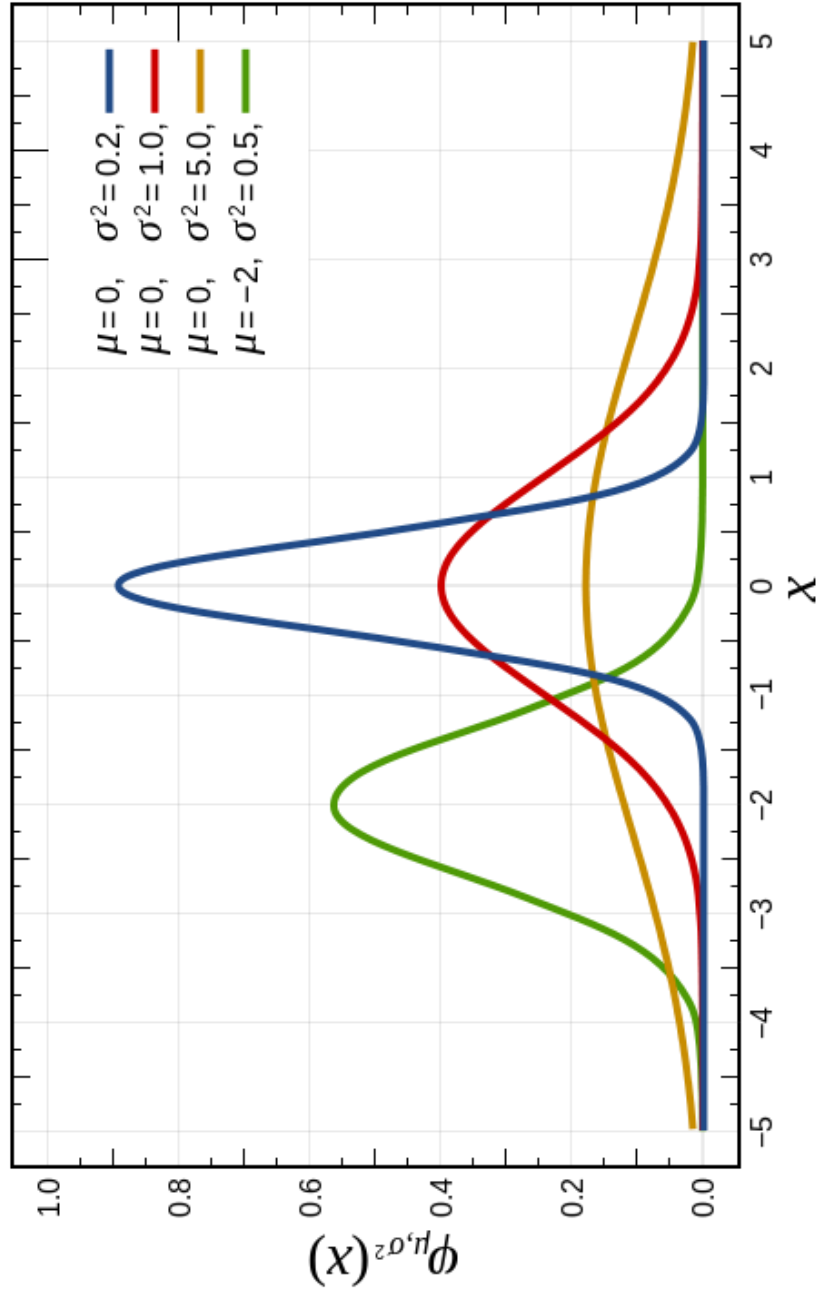
Some asset classes did not provide the downside protection that was expected.

Still, correlation convergence does not explain 2008 performance.

# NON-NORMALITY



- A normal distribution is good predictor of investment returns in most markets. However, it underestimates the size and frequency of “Left Tail” events.
- If it is assumed that returns follow a normal distribution, the “worst-case” portfolio return of -15.67% should happen on average once every 100 years.
- The actual return of ----29.68% should happen once every 35,284 years
- Something like it has happened three times in eighty years.



# WHAT A DIFFERENCE A DECADE MAKES

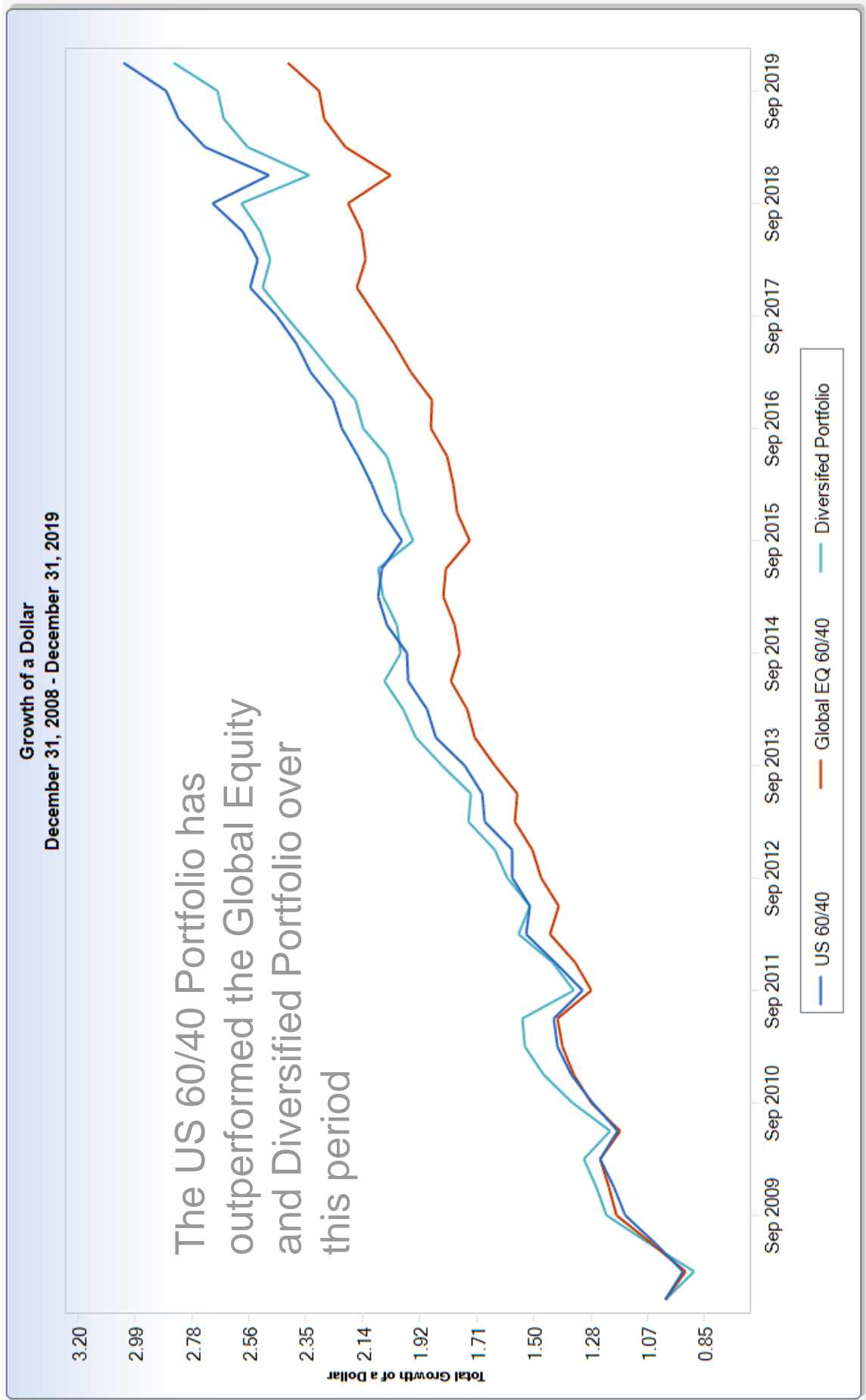
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- Wilshire forward looking capital market assumptions are show in the table below
- Highlighted column shows realized returns for comparison purposes

Asset Classes	Dec 2019		Realized Returns 2009-2019	Dec 2008	
	Return Assumption 10 Years Forward	Return Assumption 10 Years Forward		Return Assumption 10 Years Forward	Risk Assumption
U.S. Equity	5.75	8.50	14.70	17.00	16.00
Non-U.S. Equity	6.50	8.70	7.85	18.95	17.25
Cash	1.85	2.00	0.84	1.25	1.25
Core Bonds	2.85	4.00	3.94	5.15	5.00
U.S. TIPS	2.15	3.50	4.07	6.00	6.00
High Yield	4.30	8.50	11.41	10.00	10.00
Private Equity	7.95	11.55	15.01	28.00	26.00
Real Assets	5.90	6.70	8.26	8.75	7.50
Commodities	3.60	3.50	-2.79	15.00	13.00
CPI	1.75	1.50	1.84	1.75	1.75

# POST GFC PERFORMANCE

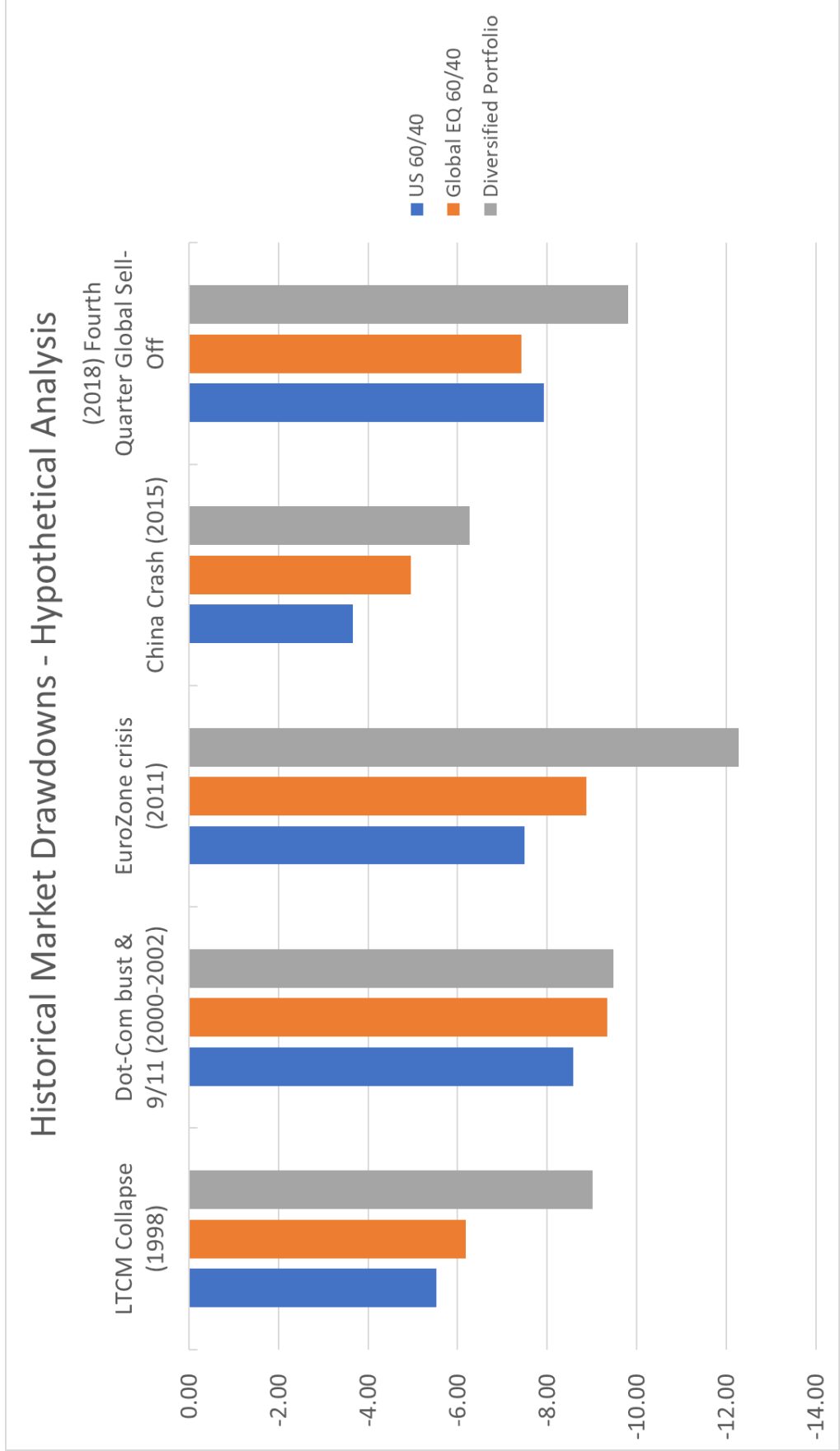
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# STRESS TEST ANALYSIS

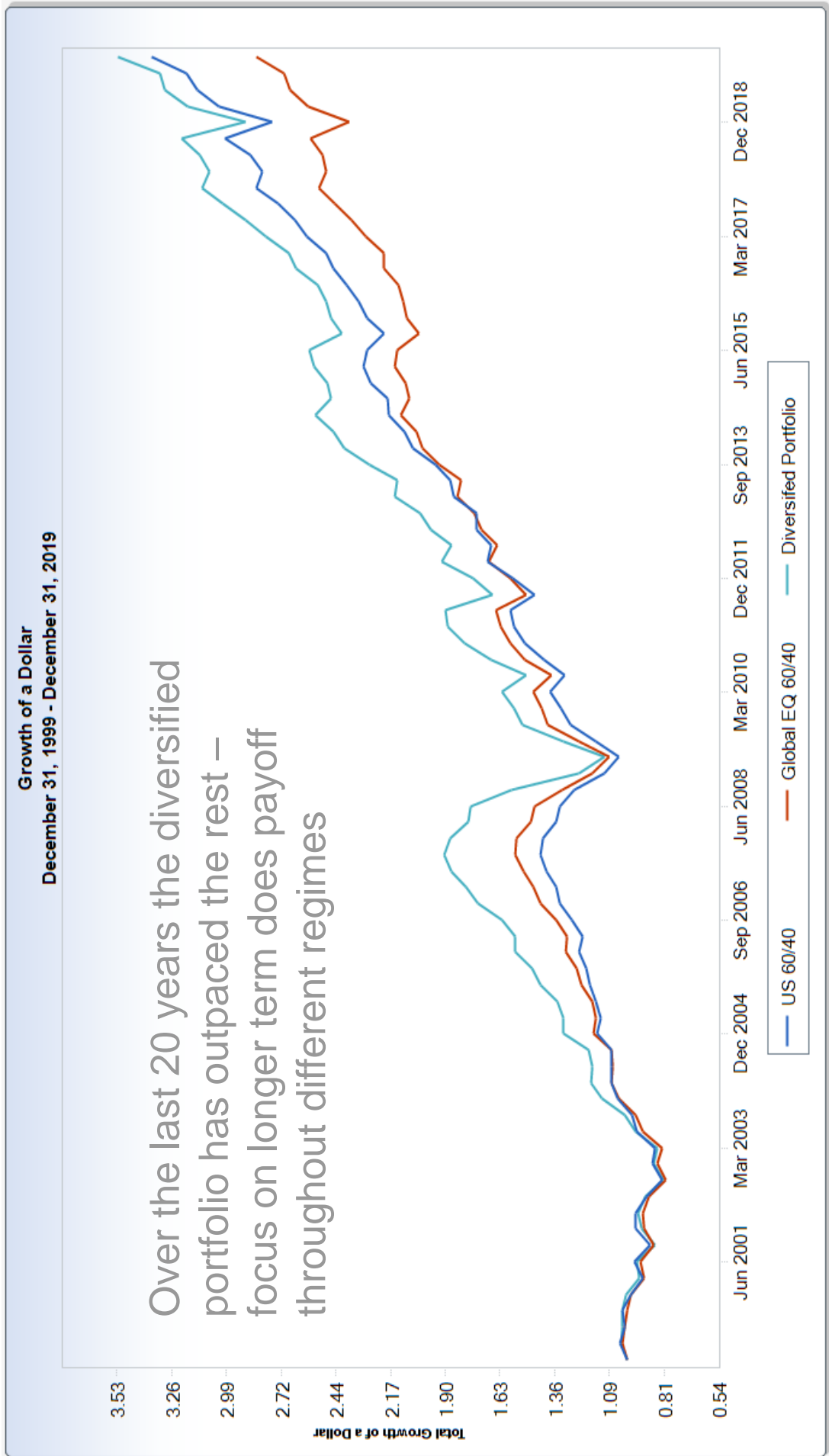
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Examples of some historical left-tail events show that diversification should not be judged as tail risk protection



# LONGER TERM TRENDS SUPPORT DIVERSIFICATION

03/20/2020





## Wilshire Consulting

# MANAGING THROUGH MARKET DRAWDOWNS

## In Case of Drawdown, Break Glass

### **If you are reading this note, we are likely experiencing a market selloff**

Whether it is a technical market correction (i.e. stocks down 10% or more) or an official bear market (down 20% or more), every drawdown is unique, and each is uncomfortable to navigate. Some are triggered by economic slowdowns, some by geopolitical circumstances and others, like today's market stress, by exogenous events like a health/pandemic crisis. In the future, it is possible that a drawdown may be triggered by climate change-linked extreme weather events. Though we know the catalyst of our current market volatility, Coronavirus Disease 2019 (COVID-19), our general focus in this memo is aimed at assisting asset owners with long-term investment objectives to manage portfolios through these stressed markets. We therefore spend little time attempting to project the short-term health, economic or market impacts from COVID-19. We recognize and openly acknowledge that we have no unique insight or edge in accurately projecting such things. There is no question that COVID-19 is negatively impacting the U.S and global economies in meaningful ways, but even though we can observe how markets have discounted current conditions, how those conditions might change and how markets will respond to those changes are highly unknown. We would be dubious of and caution against actively trading portfolios based on the opinions of market prognosticators who express their short-term views around these issues with any degree of confidence. While it appears less likely that COVID-19 will be behind us soon, there is a very wide range of potential outcomes and market reactions. As such, rather than guess on how the serious impacts of the Coronavirus might play out, the remainder of this note will 1) provide statistical analysis of past market corrections, 2) articulate Wilshire's beliefs regarding investments in growth assets (i.e. stocks), 3) provide empirical evidence to support the value of adhering to established rebalancing policies during times of market stress, and 4) look ahead to strategic challenges in structuring portfolios to meet our investment objectives. Spoiler alert: in this note we are 'pounding the table' to make the case and provide supporting evidence that investors should stay the course and follow prescribed rebalancing policies (see Section 3 on page 3, in particular, for that pitch).

### **1) Review of Historical Market Corrections**

We begin with an empirical review of all U.S. stock market corrections (i.e. selloffs of -10% or more) from 1926 to today; encompassing nearly 100-years of monthly data. The subsequent table shows each episode (18 in total with half, or nine drawdowns, reaching bear market territory, a decline of -20% or more). We focus attention to the green rectangular bar highlighting summary statistics across all eighteen selloffs. Long-term investors should take some comfort from the historical resiliency of markets to recover unrealized losses. In the table, we contemplate an investor with worst-case -scenario timing: this woeful investor buys stocks at each monthly market peak (i.e. immediately preceding each sell-off). Despite suffering an average initial loss of -27.9% (with a median of -20.2%), over the long-term, the same investor earns an

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average annualized return of 4.1% and 8.0% over 5- and 10-year holding periods, respectively (with median annualized returns of 5.7% and 7.6%, respectively). As noted above, while these historical statistics are a comforting reminder of the benefit of long-term horizons, they often seem outdated or somehow irrelevant in the midst of the fear of a current market selloff. "This time" always feels different, because it is. However, unless we expect that stocks will never return to their previous peaks, a bearish sentiment for even the most pessimistic of forecasters, we should look to this historical evidence for intestinal fortitude in weathering today's challenges.

### Market Corrections Since 1926

Date of Market Correction			Duration (# months)		Depth of	Annualized Returns If Purchased at Peak	
Peak	Trough	Recovered	Sell-off	Recovery	Drawdown	5 Years	10 Years
Aug-1929	Jun-1932	Jan-1945	34	151	-83.4%	-17.4%	-4.9%
Feb-1937	Mar-1938	Mar-1944	13	72	-50.0%	-8.6%	4.0%
May-1946	Oct-1946	Oct-1949	5	36	-21.6%	9.1%	15.5%
Jul-1956	Feb-1957	Jul-1957	7	5	-10.2%	10.0%	9.0%
Jul-1957	Dec-1957	Jul-1958	5	7	-15.0%	7.6%	10.7%
Dec-1961	Jun-1962	Apr-1963	6	10	-22.3%	5.7%	7.4%
Jan-1966	Sep-1966	Mar-1967	8	6	-15.6%	4.3%	4.0%
Nov-1968	Jun-1970	Mar-1971	19	9	-29.2%	0.4%	3.1%
Dec-1972	Sep-1974	Dec-1976	21	27	-46.4%	-0.1%	7.6%
Aug-1978	Oct-1978	Mar-1979	2	5	-11.2%	17.1%	14.8%
Nov-1980	Jul-1982	Oct-1982	20	3	-18.8%	12.1%	11.8%
Jun-1983	May-1984	Dec-1984	11	7	-10.8%	12.8%	13.3%
Aug-1987	Nov-1987	Apr-1989	3	17	-29.8%	7.7%	13.4%
May-1990	Oct-1990	Feb-1991	5	4	-16.8%	11.5%	16.7%
Jun-1998	Sep-1998	Nov-1998	3	2	-12.0%	-1.3%	3.6%
Aug-2000	Sep-2002	Mar-2006	25	42	-44.1%	-1.6%	-1.1%
Oct-2007	Feb-2009	Mar-2012	16	37	-51.0%	0.6%	7.6%
Sep-2018	Dec-2018	Apr-2019	3	4	-14.3%	?	?
<b>Market Correction Statistics (18)</b>	<b>Minimum</b>		2	2	-83.4%	-17.4%	-4.9%
	<b>Average</b>		11	25	-27.9%	4.1%	8.0%
	<b>Median</b>		8	8	-20.2%	5.7%	7.6%
	<b>Maximum</b>		34	151	-10.2%	17.1%	16.7%
<b>Bear Market Statistics (9)</b>	<b>Minimum</b>		3	9	-83.4%	-17.4%	-4.9%
	<b>Average</b>		16	45	-42.0%	-0.4%	5.8%
	<b>Median</b>		16	36	-44.1%	0.4%	7.4%
	<b>Maximum</b>		34	151	-21.6%	9.1%	15.5%

Source: Wilshire Compass (S&P 500 1926-1970, Wilshire 5000 1971-Forward)

## 2) Why we hold growth assets

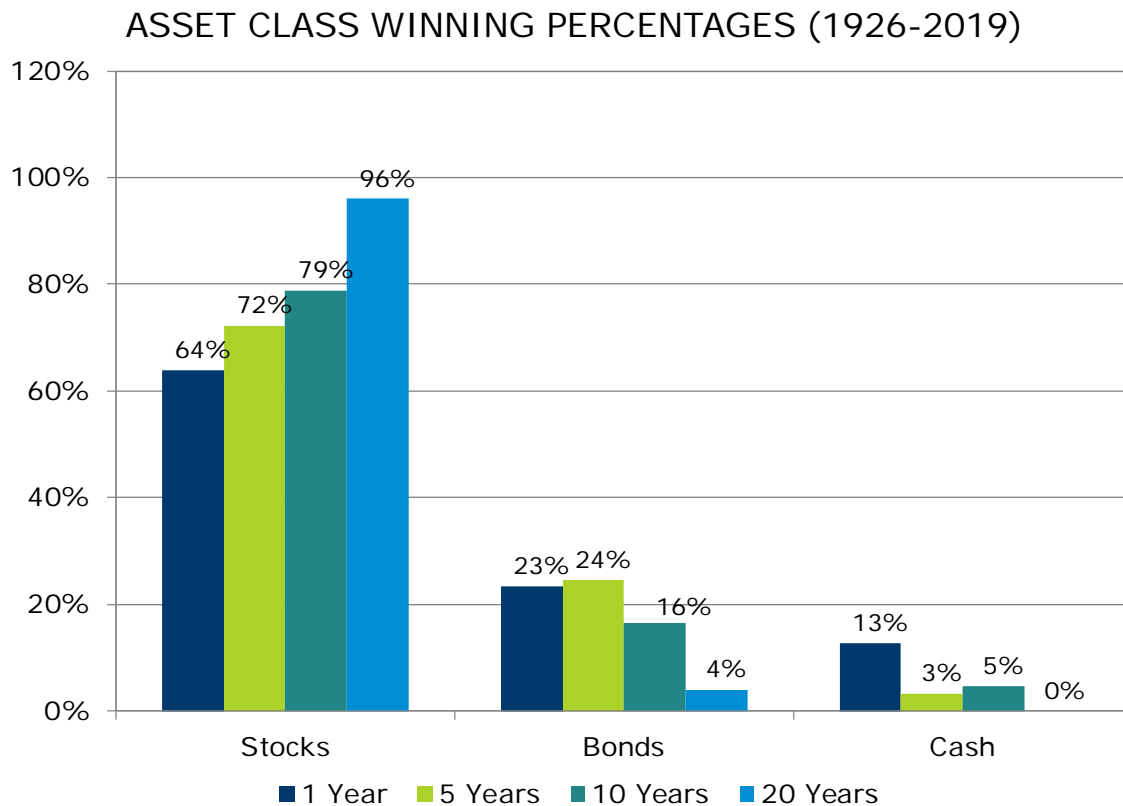
Building from the empirical data provided above, we turn to a more qualitative defense for holding risk assets. Barring any major disagreement with the basic investment beliefs presented below, these tenets should bolster conviction and argue for maintaining portfolio positioning through market turbulence:

1. We/many hold significant allocations to stocks and other growth assets because of their attractive long-term return potential (both in absolute and risk-adjusted terms).
2. While the short-term direction and path of returns for growth assets is unpredictable, we know with virtual certainty that there will be periods of significant drawdown.

- We can only harness the returns expected in point #1 above by accepting the unpredictable and often uncomfortable return pattern noted in point #2 (i.e. we are highly unlikely to capture the upside without exposing ourselves to the downside).

While we specifically discuss the value of rebalancing in the next section, we suspect that some market participants might quibble with us on the third bullet from above. In response, we note that empirical evidence debunks the effectiveness of market timing. The notion that investors can have perfect foresight by getting out of markets prior to drawdowns and reentering in time for the recovery is simply not a credible strategy. Though Wilshire does occasionally attempt to exploit market volatility to express marginal market or structural tilts within our discretionary portfolios, these activities tend to be infrequent in number, modest in size, and directionally consistent with typical rebalancing transactions (i.e. selling recent winners to buy recent laggards when valuations support such trades).

Below, we present the historical winning percentages between stocks, bonds and cash from 1926 to 2019 to underscore the strength of the beliefs noted above in supporting the role of growth assets for long-term investors. Notice how the dependability of the equity risk premium increases with the length of holding periods; outpacing bonds and cash just 64% of the time over one-year holding periods versus a more dependable 79% and 96% of the time over ten- and twenty-year rolling periods, respectively. Investors risk lowering those odds by tactically jumping in and out of stocks over time.



Source: Wilshire Compass

### 3) The Value of Disciplined Rebalancing

Establishing prudent rebalancing guidelines is a critical element of a robust portfolio management strategy. Formalizing those procedures in a written investment policy statement (IPS) provides important governance to ensure that portfolios are managed in a manner that is consistent with those researched and articulated plans. A well-constructed IPS is an institution’s best tool for guarding against behavioral risks that might result in emotionally driven, value destroying decisions during periods of market stress. The IPS pre-experiences and prescribes how an investor is to prudently respond during various market environments.

However, periods of increased uncertainty within an elevated-risk environment can be extremely uncomfortable, even for investors with strong investment policies in place. Stressed markets often pressure investors to second-guess their portfolio risk profiles and even trade assets in ways that conflict with stated long-term allocation policies. While we recognize the natural behavioral tendency to "make the pain stop," Wilshire advises clients to maintain discipline and adhere to prescribed allocation and rebalancing policies, particularly during times of heightened volatility.

An institution's liquidity needs can create challenges and sometimes materially constrain rebalancing policies, particularly during periods of market stress. When experiencing severe or extended drawdowns, investor liquidity requirements can force selling that might otherwise be contrary to stated rebalancing policy. While a detailed discussion of liquidity management is outside the scope of this note, we do raise the importance of this issue in weathering market selloffs and direct interested readers to Wilshire's "Liquidity Management: Bridge Over Troubled Water" research paper.

In the exhibit at the top of the next page, we revisit our historical data on market corrections to empirically analyze how rebalancing decisions impacted results during those historical market selloffs. The columns to the right in the exhibit attempt to quantify how a process of monthly rebalancing around a 60% stock / 40% bond portfolio might compare to approaches that react to market stress by delaying rebalancing activities (i.e. not trading). In each case, we assume that the investor chooses to deviate from their monthly rebalancing process when cumulative returns are off -5% or more from the market peak and only resumes rebalancing after stocks had fully sold off and then recovered. While we believe this to be a reasonable way to quantify what we are interested in measuring, we also examined the results had the investor immediately abandoned their rebalancing plan after the first negative month within each market correction (we provide that output, which is similar to the results below, in the appendix on page 7). Returning to the following analysis, we chose -5% as our selloff trigger since one would expect a move of at least that magnitude would be required to have an investor shaken enough to second-guess their rebalancing policy.

As can be seen from the empirical results in the table, deviating from the prescribed monthly rebalancing policy in the manner described above would have cost the investor approximately -0.30% in annualized returns across 18 market corrections (-0.32% average, -0.25% median). The results across the subset of nine bear markets is even more compelling with the suspension of rebalancing costing the investor an annualized average of -0.46% and median of -0.40%. In just one of the 18 market corrections since 1926 would the investor have been better off by suspending rebalancing activities. That sole exception occurred during the November 1980–October 1982 correction and recovery and benefited the investor by an annualized 0.17%. Interestingly, a key driver of the portfolio's return edge in the 1980–1982 period resulted from a remarkable 40% return to bonds, which benefited from a rapidly declining rate environment. So, while rebalancing cannot be guaranteed to yield better results across all market selloffs, the odds strongly favor its advantages and the one notable historical exception was driven by outsized returns from bonds rather than from disappointing returns to stocks. We recognize that rebalancing into a drawdown and during elevated market uncertainty can be extremely uncomfortable and can sometimes feel counter to a risk averse process. We therefore present these data to demonstrate the historical advantages of maintaining such discipline. The call to rebalance in no way suggests certainty around the market's next move (i.e. that it will go up, let alone by how much), but rather underscores the importance of exploiting volatility and unpredictability by systematically shifting from recent winners to recent laggards.

## Rebalancing Impact during Market Corrections Since 1926

Date of Market Correction			Total # Months	Annualized Returns (Peak to Recovery)		
				Rebal (60/40)	React to Stocks <-5%	Net
Peak	Trough	Recovered				
Aug-1929	Jun-1932	Jan-1945	185	3.5%	2.8%	-0.68%
Feb-1937	Mar-1938	Mar-1944	85	6.1%	5.0%	-1.15%
May-1946	Oct-1946	Oct-1949	41	1.3%	1.0%	-0.24%
Jul-1956	Feb-1957	Jul-1957	12	-2.4%	-2.4%	-0.08%
Jul-1957	Dec-1957	Jul-1958	12	6.5%	6.3%	-0.26%
Dec-1961	Jun-1962	Apr-1963	16	3.8%	3.4%	-0.40%
Jan-1966	Sep-1966	Mar-1967	14	1.9%	1.8%	-0.09%
Nov-1968	Jun-1970	Mar-1971	28	2.6%	2.4%	-0.20%
Dec-1972	Sep-1974	Dec-1976	48	3.6%	3.4%	-0.21%
Aug-1978	Oct-1978	Mar-1979	7	1.9%	1.7%	-0.19%
Nov-1980	Jul-1982	Oct-1982	23	8.7%	8.9%	0.17%
Jun-1983	May-1984	Dec-1984	18	5.3%	5.2%	-0.10%
Aug-1987	Nov-1987	Apr-1989	20	4.3%	3.7%	-0.64%
May-1990	Oct-1990	Feb-1991	9	6.4%	6.2%	-0.25%
Jun-1998	Sep-1998	Nov-1998	5	2.5%	2.0%	-0.55%
Aug-2000	Sep-2002	Mar-2006	67	2.7%	2.5%	-0.19%
Oct-2007	Feb-2009	Mar-2012	53	3.3%	2.9%	-0.42%
Sep-2018	Dec-2018	Apr-2019	7	3.2%	2.9%	-0.31%
<b>Market Correction Statistics (18)</b>		Minimum	5		Minimum	-1.15%
		Average	36		Average	-0.32%
		Median	19		Median	-0.25%
		Maximum	185		Maximum	0.17%
<b>Bear Market Statistics (9)</b>		Minimum	16		Minimum	-1.15%
		Average	60		Average	-0.46%
		Median	48		Median	-0.40%
		Maximum	185		Maximum	-0.19%

Source: Wilshire Compass (S&P 500 1926-1970, Wilshire 5000 1971-Forward)

Investors who either find the results presented above to be unconvincing or who routinely feel the pressure to cut-losses whenever markets sell-off 10% or more (or when exogenous risks emerge) might be well-served by reassessing their portfolios' general risk profiles, as these sentiments may signal an inconsistency between portfolio risk allocations and investor risk appetites.

### 4) How Do Recent Market Moves Impact Longer-Term Strategic Goals

While we have devoted most of this note to supporting adherence to rebalancing ranges, we must all acknowledge the very real and increased pressure recent market moves have added to the challenge of meeting long-term investment objectives. Though the Coronavirus may have served as the recent catalyst of economic and market volatility, there seem to be broader and unique challenges embedded in market pricing. U.S. stocks are down nearly -15% YTD through Monday March 9<sup>th</sup>, the CBOE Volatility Index (VIX) spiked above 50%, oil prices appear to be in freefall and, perhaps most remarkably, 10-year Treasury yields have collapsed below 1.0% for the first time ever (currently ~0.60%). The dramatic drop in rates exacerbates some of the challenges we recently discussed in our 2019 yearend memo.

On one hand, the strong recent performance of high-quality bonds (as yields fell), reinforces the "Don't Fear Duration" message of the yearend memo; specifically, that bonds, even at modest yield levels, serve a critical role within portfolios. Unfortunately, as those yields continue to fall and pull returns forward, their new all-time-low, further dampen their ability to contribute meaningfully to meeting most institutional return targets. We would refer interested readers to the asset class assumptions building block exhibit contained in our yearend memo and suggest that this picture as it relates to cash and

bonds has likely changed for the worse due to YTD changes. Rebalancing can assist in navigating short-term choppy markets, but the aftermath of this volatility may require a review of longer-term portfolio expectations. Further, as yields approach 0% in the U.S., their ability to continue providing a risk offset begins to come under pressure as yields approach their practical floor. However, today's yields do not yet fully realize that concern as developed markets in Europe have demonstrated that yields can approach levels near -1% before encountering such limits (e.g. current 10-year government yields are approximately -0.85% in Germany, -0.40% in France, -0.65% in the Netherlands and -1.00% in Switzerland).

Wilshire will continue to monitor market conditions, will update those conditions in our upcoming March 2020 assumptions suite and stands ready to work through the challenges of upcoming asset-liability studies with our clients to explore the possible trade-offs embedded in the gap between investor return needs and market expectations.

**APPENDIX**

**Rebalancing Impact during Market Corrections Since 1926**

Date of Market Correction			Total # Months	Annualized Returns (Peak to Recovery)		
Peak	Trough	Recovered		Rebal (60/40)	React to Stocks <0%	Net
Aug-1929	Jun-1932	Jan-1945	185	3.5%	2.9%	-0.61%
Feb-1937	Mar-1938	Mar-1944	85	6.1%	5.2%	-0.98%
May-1946	Oct-1946	Oct-1949	41	1.3%	1.0%	-0.24%
Jul-1956	Feb-1957	Jul-1957	12	-2.4%	-2.5%	-0.11%
Jul-1957	Dec-1957	Jul-1958	12	6.5%	6.3%	-0.26%
Dec-1961	Jun-1962	Apr-1963	16	3.8%	3.4%	-0.39%
Jan-1966	Sep-1966	Mar-1967	14	1.9%	1.8%	-0.09%
Nov-1968	Jun-1970	Mar-1971	28	2.6%	2.4%	-0.18%
Dec-1972	Sep-1974	Dec-1976	48	3.6%	3.5%	-0.18%
Aug-1978	Oct-1978	Mar-1979	7	1.9%	1.7%	-0.19%
Nov-1980	Jul-1982	Oct-1982	23	8.7%	9.1%	0.40%
Jun-1983	May-1984	Dec-1984	18	5.3%	5.4%	0.05%
Aug-1987	Nov-1987	Apr-1989	20	4.3%	3.7%	-0.64%
May-1990	Oct-1990	Feb-1991	9	6.4%	6.2%	-0.23%
Jun-1998	Sep-1998	Nov-1998	5	2.5%	2.0%	-0.55%
Aug-2000	Sep-2002	Mar-2006	67	2.7%	2.6%	-0.13%
Oct-2007	Feb-2009	Mar-2012	53	3.3%	2.9%	-0.35%
Sep-2018	Dec-2018	Apr-2019	7	3.2%	2.9%	-0.31%
<b>Market Correction Statistics (18)</b>	<b>Minimum</b>	5		<b>Minimum</b>	-0.98%	
	<b>Average</b>	36		<b>Average</b>	-0.28%	
	<b>Median</b>	19		<b>Median</b>	-0.23%	
	<b>Maximum</b>	185		<b>Maximum</b>	0.40%	
<b>Bear Market Statistics (9)</b>	<b>Minimum</b>	16		<b>Minimum</b>	-0.98%	
	<b>Average</b>	60		<b>Average</b>	-0.41%	
	<b>Median</b>	48		<b>Median</b>	-0.35%	
	<b>Maximum</b>	185		<b>Maximum</b>	-0.13%	

Source: Wilshire Compass (S&P 500 1926-1970, Wilshire 5000 1971-Forward)

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Questions and discussion followed.

Trustee Wallace joined the meeting via teleconference at 9:12 a.m.

(20-03-02) (Consent Agenda) The Chair presented an agenda consisting of a Consent Agenda. The following items remained on the Consent Agenda since no Board member asked for their removal.

Approval of Minutes

Regular Meeting 20-02-28  
Executive Session 20-02-28ES

Schedules - Dated March, 2020

- Schedule A - Benefit award listing of retirement, temporary disability, death benefits, and refund of employee contributions processed during the preceding calendar month under Article 7 of the Illinois Pension Code.
- Schedule B - Adjustment of Benefit Awards showing adjustments required in benefit awards and the reasons therefore.
- Schedule C - Benefit Cancellations.
- Schedule D - Expiration of Temporary Disability Benefits terminated under the provisions of Section 7-147 of the Illinois Pension Code.
- Schedule F - Benefits Terminated.
- Schedule G - Administrative Benefit Denials.
- Schedule P - Administrative Denial of Application for Past Service Credit.
- Schedule R - Prior Service - New Governmental Units

Bids

FS Networks Materials and Professional Services  
Approved Bidder: Konsultek, Inc.  
Approved Bid: \$254,169.

Contractor Services - Flooring in Print, Mail and Copy Rooms  
Approved Bidder: West DuPage Construction  
Approved Bid: \$33,012.23.

Print Center - Printer/Copiers  
Approved Bidder: Impact Networking  
Approved Bid: \$80,342.



Nimble Storage Array for Horizon  
Approved Bidder: American Digital Corporation  
Approved Bid: \$102,356.

Avaya Telephony System Enhancements & Horizon Integration - Change Order 2.0  
Approved Amount: \$9,500 (new ceiling of \$887,867.23)

Generator Addendum 1.0 - Omnimetrix Monitoring System  
Approved Amount: \$1,420 ceiling increase

Participation of New Unit of Government

Village of Carbon Hill  
County: Grundy  
2019 Rate: 5.19%  
Effective Participation Date: May 1, 2020  
Number of Participating Employees: 1

March Financial Reporting Package

Impact of 2019 Year-To-Date Investment Income of Employer Reserves, Funding Status and Average Employer Contribution Rate

Statement of Fiduciary Net Position

Schedule T - Report of Expenditures

Acceptance of 2019 SOC-2 Type 2 Report

It was moved by Ms. Henry, seconded by Ms. Stanish, to approve the items on the consent agenda.

Vote: Unanimous Voice Vote  
Absent: None

(20-03-03) (Approval of Resolution on Reinstatement of Surviving Spouse Refund) General Counsel recommended that the Board adopt a resolution which permits applicants under Section 7-159(d) to make a lump sum payment to establish eligibility between May 1, 2020 and April 30, 2021.

She noted that the Illinois legislature recently enacted Public Act 101-0610, which amends Section 7-159 and relates to establishment of a surviving spouse annuity. The proposed board resolution provides additional details regarding how an applicant can make payment establish eligibility for the surviving spouse annuity.

After questions and discussion, it was moved by Ms. Stanish, seconded by Mr. Wallace, to adopt the following resolution:

WHEREAS, Public Act 101-0610, effective January 1, 2020, created Section 7-159(d) of the Pension Code which provides rules relating to refunds of survivor credits; and

WHEREAS, Public Act 101-0610 permits eligible surviving spouses to repay the previously refunded surviving spouse credits in order to establish eligibility for a surviving spouse annuity during a one-year window beginning May 1, 2020; and

WHEREAS, it is necessary to adopt rules for the efficient administration of Section 7-159(d).

THEREFORE BE IT RESOLVED that the following administrative rules be and are hereby adopted by the Board of Trustees:

- A. To establish eligibility for a surviving spouse annuity under 40 ILCS 5/7-159(d), payment may be made by making a lump sum payment of the refunded survivor credits with interest calculated to the date of payment. Multiple or partial payments will be rejected and returned to the applicant.
- B. Payment must be received in IMRF offices no later than April 30, 2021 in order to establish eligibility under Section 7-159(d).

Vote:

Aye: Williams, Stafford, Miller, Stanish, Kuehne, Henry, Wallace  
Nay: Copper  
Absent: None

(20-03-04) (Approval of Resolution Renewing the ICMA Deferred Compensation Contract (for a Five Year Term)) The Chief Investment Officer presented a resolution regarding renewing IMRF's ICMA Deferred Compensation Contract (for a five year period) to the Board for approval.

She stated that during the first quarter of 2020, Staff reviewed the fee structure for IMRF's 457 Plan provider ICMA-RC. Due to the IMRF 457 Plan's growth in assets and number of participants following the Board approved 457 Plan consolidation in December 2015, Staff looked to renegotiate the Plan's administration fee to an even more competitive rate.

The Chief Investment Officer reported that IMRF's current IMRF Investment Staff recommend:

1. Authorize Staff to amend the current ICMA-RC 457 Plan contract to reflect the new administration fee of 9.5 basis points and a five year term extension, subject to satisfactory legal diligence on the legal contract.
2. Authorize Staff to complete all documentation necessary to execute this recommendation.

After questions and discussion, it was moved by Mr. Kuehne, seconded by Ms. Stanish, to adopt the following Resolution:

WHEREAS, section 7-198 of the Illinois Pension Code authorizes the Board of Trustees of the Illinois Municipal Retirement Fund to establish rules necessary or desirable for the efficient administration of the Fund; and

WHEREAS, under sections 7-121, 7-186, 7-189, and 7-190 of the Pension Code, the Board of Trustees is the governing body of IMRF and the employer of the IMRF staff; and

WHEREAS, the Board of Trustees has previously established a 457 Plan administered by ICMA-RC for IMRF staff; and

WHEREAS, the established ICMA-RC 457 Plan must periodically be renewed in order to continue administration of the Plan; and

WHEREAS, the Fund may reduce administrative costs of the Plan upon renewal of the contract for a period of five years.

NOW THEREFORE BE IT RESOLVED that the ICMA-RC contract for administration of a 457 Plan for the employees of the Board of Trustees of the Illinois Municipal Retirement Fund is hereby extended for a period of five years, subject to satisfactory legal diligence on the legal contract. The amendment shall reflect the new administration fee of 9.5 basis points.

BE IT FURTHER RESOLVED that the Executive Director is hereby authorized and directed to take such further action as may be necessary or advisable to effectuate this Resolution.

Vote: Unanimous Voice Vote  
Absent: None

(20-03-05)(Executive Director Compensation) It was moved by Ms. Henry, seconded by Mr. Kuehne, to recommend a 15.89% increase for the Executive Director, effective January 1, 2020.

Vote:  
Aye: Henry, Kuehne, Stanish, Stafford, Wallace  
Nay: Williams, Copper, Miller

(20-03-06) (Report of the Executive Director) The Executive Director discussed how IMRF is responding to the COVID-19 Pandemic.

He stated that IMRF's top priority is employee health and safety, and IMRF's primary operational focus is delivering promised benefit payments to its members on time.

Trustee Henry left the meeting at 9:36 a.m.

(20-03-07) (Trustee Comments) Trustee Miller reiterated the Board's continuing opposition to any legislation that would lower IMRF's funding goal below 100%.

(20-03-08) (Adjournment) It was the moved by Ms. Williams, seconded by Mr. Stafford, to adjourn the Board Meeting at 9:50 a.m., to reconvene in the Fund offices, 2211 York Road, Suite 400, Oak Brook, Illinois, at 9:00 a.m. on May 29, 2020.

Vote: Unanimous Voice Vote  
Absent: Henry

\_\_\_\_\_  
President

\_\_\_\_\_  
Date

\_\_\_\_\_  
Secretary

\_\_\_\_\_  
Date

Schedules A, B, C, D, E, F, G, P and R are omitted from this copy of Minutes. These schedules are identical to schedules attached to Minutes distributed to Board of Trustees prior to meeting.